Hazardous Materials Unit

Operating Manual

Office of Environmental Services
Indiana Department of Transportation

TABLE OF CONTENTS

CHAPTER 1 - INTRODUCTION 2
1.1 Purpose 2
1.2 HazMat Regulations 3
1.3 Hazardous Materials Unit Duties 5
1.4 Required Training 6
CHAPTER 2 - ACCIDENTAL DISCOVERIES 6
2.1 Spills 7
2.2 Right of Way & Parcel Discoveries 9
2.3 Known Right of Way Contamination 12
CHAPTER 3 - SITE ASSESSMENTS 14
3.1 Red Flag Investigation (RFI) 14
3.2 Phase I - General 18
3.3 Phase II 23
3.4 Further Site Investigation (FSI) 31
3.5 Corrective Action Plan (CAP) 33
3.6 Remediation 34
3.7 Environmental Restrictive Covenant 35
CHAPTER 4 - ASBESTOS 36
4.1 Parcels 36
4.2 Bridges 38
CHAPTER 6 - LEAD 40
CHAPTER 7 - GLOSSARY 41
7.1 Acronyms 41
7.2 Definitions 43

Introduction

Purpose

The purpose of this manual is to provide direction and guidance in the operation of the Hazardous Materials (HazMat) Unit, which is a part of the Policy Section of the Office of Environmental Services. The primary duties of the unit are to provide expertise in matters of hazardous materials for the Division of Production. As such the target audience for this manual is:

- Hazardous Materials Unit Members
- Other Office of Environmental Services (OES) Staff
- District Environmental Staff
- Other INDOT staff
- Consultants

This manual was compiled using many different Federal and State regulations, laws, rules, and technical guidance. Many documents from environmental agencies were reviewed and consulted in order to provide the most accurate and useful information. This manual is in no way designed or intended to circumvent, replace, or override any policy, rule, law, or regulation written governing hazardous materials. The information contained within this document is solely for the purpose of supplementing these regulations and guiding HazMat Unit members in the performance of their duties.

HazMat Regulations

Many laws have been written regarding the transportation, handling, and cleanup of hazardous materials. This section is concerned with some of the major rules and some of the more applicable regulations as they pertain to the daily operation of the HazMat Unit.

Federal Regulations

Toxic Substance Control Act (1976): Requires testing of potentially toxic chemicals to determine the effect and exposure limits. This was the first major legislation to regulate hazardous substances.

Resource Conservation and Recovery Act (RCRA) (1976 and 1980 amend): Provides a mechanism for the filing of lawsuits aimed at cleaning up hazardous waste dump sites.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (1980): Assigns cleanup costs to responsible parties. CERCLA is also known as the Superfund Act.

Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (1983): Deals with employees' exposure to hazardous chemicals. This is also referred to as the "Employee Right to Know Act".

Title III of Superfund Amendment and Reauthorization Act (SARA) (1986): Also known as the "Emergency Planning and Community Right to Know Act." It revises and expands CERCLA.

49 Code of Federal Regulations (CFR) § 172 (1980): Governs the transportation of hazardous materials.

29 CFR§1910.120 (1989) HAZWOPER: Developed to protect workers from the health and safety risks of exposure to hazardous substances. It is used in conjunction with OSHA standards.

40 CFR § 280: Governs the operation, installation, upgrade, release detection and response, and closure of regulated USTs.

40 CFR§ 763 (AHERA) Asbestos Hazard Emergency Response Act: Governs Asbestos Containing Materials (ACM) in schools.

State Regulations

IC 13-20-7: Special Waste Certification Requirements: Covers management requirements for materials designated as special wastes.

329 IAC 9 Solid Waste Management Board Article 9: Covers UST performance standards, reporting and record keeping, releases, corrective action, and closure.

Article 79 of the Uniform Fire Code: Provides proper handling and disposal regulations for flammable and combustible liquid and corresponding tanks.

326 IAC 14-10 Emission Standards for Asbestos in Demolition and Renovation Operations: Covers notification requirements for demolition and renovation activities. Indicates when an asbestos inspection is required and establishes guidelines for these inspections.

326 IAC 18-1 to 18-2-13 Indiana's Asbestos Management law: Regulates the training, licensing, and qualification to inspect, plan asbestos activities, design asbestos projects, supervise, work, and contract asbestos work.

327 IAC 2-6.1 Indiana Spill Reporting, Containment and Response Rule: Governs the reporting and containment/response to spills of the following:

1. Hazardous Substances
2. Extremely Hazardous Substances
3. Petroleum
4. Objectionable Substances

Hazardous Materials Unit Duties

The duties of the Hazardous Materials Unit include the following.

I. Providing guidance on tasks such as:

- Provide guidance on accidental discovery/releases during construction.
- Answering questions regarding general HazMat issues from INDOT personnel and consultants

II. Write and review HazMat documents such as:

- Writing Phase I assessments (Ph I)
- Writing Phase II assessments (Ph II)
- Writing Further Site Investigations (FSI)
- Writing Corrective Action Plans (CAP)
- Writing Environmental Restrictive Covenants(ERC)
- Writing Asbestos Bridge Reports
- Reviewing HazMat Section of National Environmental Policy Act (NEPA) documents
- Reviewing Phase I assessments performed by consultants
- Reviewing Phase II assessments performed by consultants
- Reviewing FSIs performed by consultants
- Reviewing CAPs performed by consultants
- Reviewing ERC performed by consultants
- Reviewing Closure Reports for Underground Storage Tanks (UST)
- Reviewing Asbestos Bridge Reports
- Reviewing Asbestos Parcel Reports

III. Other work such as:

- Initiating response to prevent the spread of free product on projects in construction
- Responding to requests for action from Indiana Department of Environmental Management (IDEM)
- Ensuring any Agreed Order (AO) requirements with IDEM are carried out
- Other duties in the area of hazardous materials not specifically covered by other INDOT Units
- Other duties as assigned by the Policy Administrator

This list is neither all inclusive nor purposefully restrictive.

The unit recognizes the need for INDOT to work as a team in order to achieve its mission of planning, maintaining and operating a superior transportation system. In doing so, some degree of flexibility must be inherent in any procedural manual. It is the desire of this manual to allow such flexibility.

Required Training

The Unit has specific training requirements. In order to sign Environmental Site Assessments (ESAs) for submission to IDEM, at least one person in the HAZMAT unit must be trained and certified/licensed as either (EPA 560-F-05-240):

- Professional Engineer plus three years of relevant experience
- Professional Geologist plus three years of relevant experience
- State or Tribal Certificate (CHMM, CEP, etc), plus three years of relevant experience
- Hold a bachelor's degree in a science or engineering field plus 5 years full time relevant experience
- Or ten years full time relevant experience

All members of the HazMat unit will be trained in:

- ArcGIS I
- ArcGIS II
- INDOT Project Development Process (PDP)
- SPMS use and function

All HazMat unit field personal will have the following training or certification:

- Hazwoper UST cleanup/removal
- Hazwoper UST cleanup/removal Supervisor
- Hazard communication/ recognition
- Asbestos building inspector
- Photo Ionization Detector (PID) operation
- Other field equipment operation as determined necessary
- Basic soil classification
- Sampling techniques
- Phase I and Phase II report preparation
- INDOT safety
- First aid/CPR

The HazMat unit GIS Specialist will be trained in:

- Micro Station

The HazMat Supervisor will be trained in:

- Site plan preparation
- Health and Safety Plan (HASP) preparation

Other training will be offered and requirements will be updated as needed.

Accidental Discoveries

This manual only addresses Right of Way (ROW) purchases, INDOT purchased parcels, and Construction site spills. The HazMat unit is neither responsible for, nor capable of responding to spills along

roadways or at INDOT facilities. These incidents are the responsibility of IDEM and INDOT's Office of Facility Management.

A large portion of the work performed by the HazMat unit entails providing assistance to other INDOT business units. One of the most common types of requests for assistance are related to accidental discoveries of hazardous materials. These discoveries vary from discovery of unknown underground storage tanks to unknown contaminants flowing from the ROW into a drainage ditch. This chapter will provide guidance on how to respond to these types of discoveries and the responsibilities of the unit in case of such an occurrence.

Spills

Spills are governed by:

- **327 IAC 2-6.1**
- **Title III of SARA** (1986)
- **49 CFR** § **172** (1980)

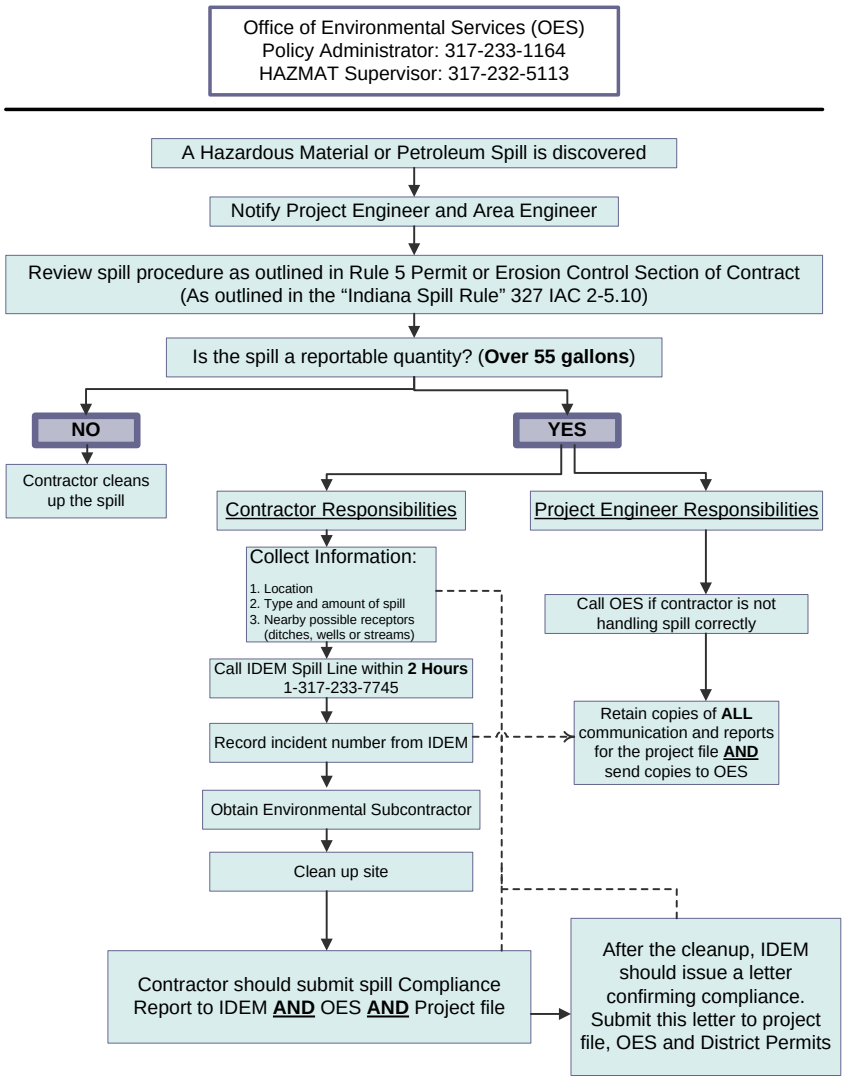
Under these laws the responsibility for clean up and any associated remediation for a spill is first the responsibility of the spiller. If the spiller is unknown or is unable to conduct remediation, then the responsibility lies with others determined to have strict liability for the creation, storage, or transportation of the regulated material.

Accidental discovery of spills often happens during the construction phase of a project. To the extent possible these should be handled by the contractor as provided by the contract. At most the HazMat unit should be involved in verifying compliance with applicable laws, documenting the spill, and verifying contractors' claims for prices. Occasionally, the HazMat Unit may also help the Project Engineer (PE) determine correct action if the contractor is not dealing with the spill correctly. When contractors or project engineers contact the HazMat Unit for guidance in properly reporting and documenting a spill, the following flow diagram should be used.

Contractor Spills

Hazardous Material Spills on an INDOT Construction Site

Revised January 9, 2008



Right of Way & Parcel Discoveries

Right of Way (ROW) discoveries are cases in which INDOT's ROW is receiving contaminants from a source off site. Often in the case of Right of Way (ROW) discoveries the contamination has come from adjacent property or parts of the parcel which are not owned by INDOT. In this case IDEM will notify the responsible party of the contamination and their responsibilities. INDOT's responsibilities are:

a. Worker Safety
b. Prevention of furthering existing environmental issues.

Parcel discoveries occur when INDOT encounters a source of contamination on ROW owned by the Department. In these cases the procedures and involvement of the unit will be similar, but will extend to managing remediation of the property as well.

Situations may present themselves when the following flow charts and guidance are not strictly applicable. An example of such is for discoveries encountered during utility relocations. These discoveries should be brought to the attention of the Utility Railroad Manager, after proper spill notification, for determination of responsibility for and method of payment. Consultation between the utility representative, the Utility Railroad Manager, and the HazMat unit will follow. This consultation will provide for the proper outcome of the spill response and remediation.

Right of Way Discovery Procedure:

Below are the procedures to be followed if contamination is discovered in the right of way:

1. Report contamination*.
2. Perform a Phase I for the ROW.
3. Send a copy to the appropriate IDEM section.
4. Copy report to Project Manager (PM)/PE/PS.
5. Review any report/ results produced by environmental sub-contractor.
6. Follow the regulations, policies, and procedures according to IDEM for mitigation, investigation, and cleanup of the site.

***If the HazMat Unit is contacted before IDEM, ensure the reporter understands the procedure for reporting spills and the associated timeline.**

Parcel Discovery procedure:

Below are the procedures to be followed if contamination is discovered on an INDOT owned parcel:

1. Report Contamination*.
2. Work with environmental sub-contractor to develop a remediation plan if necessary.
3. Review Initial Site Characterization (ISC) and Closure Report produced by environmental sub-contractor.
4. Ensure proper implementation of IDEM recommendations.
5. Respond to and relate any remaining issues raised by IDEM regarding cleanup.

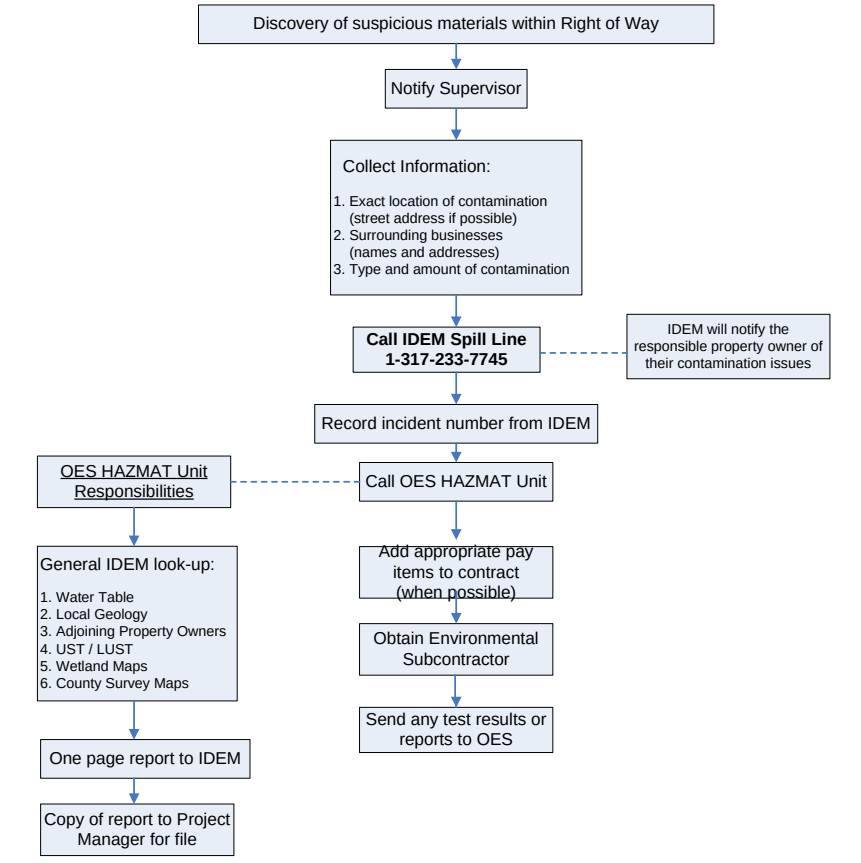
***If the HazMat Unit is contacted before IDEM, ensure the reporter understands the procedure for reporting spills and the associated timeline.**

The above two procedures are outlined in the following flow diagrams:

Procedure for Discovery of Contaminated Materials or Unknown Underground Storage Tanks (USTs) within **Right Of Way** (ROW)

Revised January 9, 2008

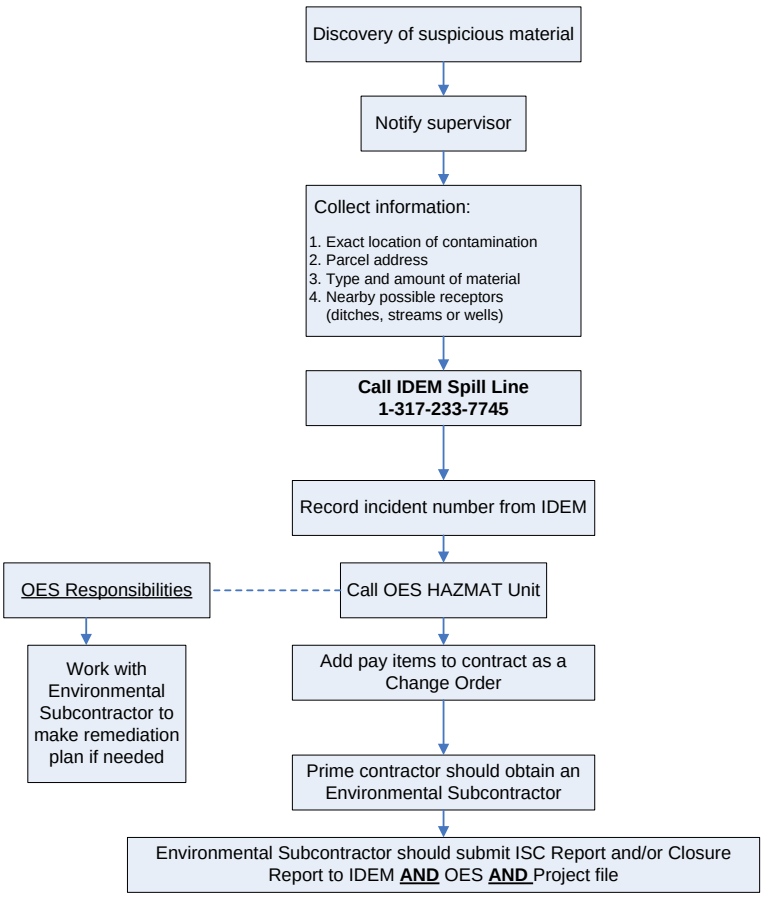
Office of Environmental Services (OES)
Policy Administrator: 317-233-1164
HAZMAT Supervisor: 317-232-5113



Discovery of Contaminated Materials or Unknown Underground Storage Tanks (USTs) on **INDOT Owned ROW**

Revised January 9, 2008

Office of Environmental Services (OES)
Policy Administrator: 317-233-1164
HAZMAT Supervisor: 317-232-5113



Known Right of Way Contamination

This type of discovery normally occurs prior to construction and well enough in advance to allow proper documentation and remediation planning to occur. These projects normally require site assessments to be prepared. It is for these types of discovery that the majority of the HazMat unit's time and effort is assigned.

The majority of contamination is discovered as a result of a HazMat Unit site assessment. That assessment can be as brief as a Red Flag Investigation or as extensive as a Phase I and Phase II HAZMAT investigation. These reports are either performed by the HazMat unit or provided by a consultant under contract to the unit. All reports are reviewed and approved by the HazMat Unit Supervisor, the Policy Administrator, or designee.

A Red Flag Investigation (RFI) outlines the potential hazardous materials concerns within the project area. After this initial investigation is completed, the NEPA document preparer will request a Phase I (Ph I) investigation from the HazMat unit if judged to be necessary, based upon the proximity of HazMat concerns and type of work to be performed. Phase I investigations will primarily be conducted by the HazMat Unit Environmental Scientist designated for the originating District. However, if time, staff obligations, or complexity dictate, the Phase I investigation may be assigned to either another unit member or an on-call consultant. If the Phase I investigation indicates further action is warranted, additional investigation in the form of a Phase II investigation will be performed either by the HazMat unit or an on-call consultant.

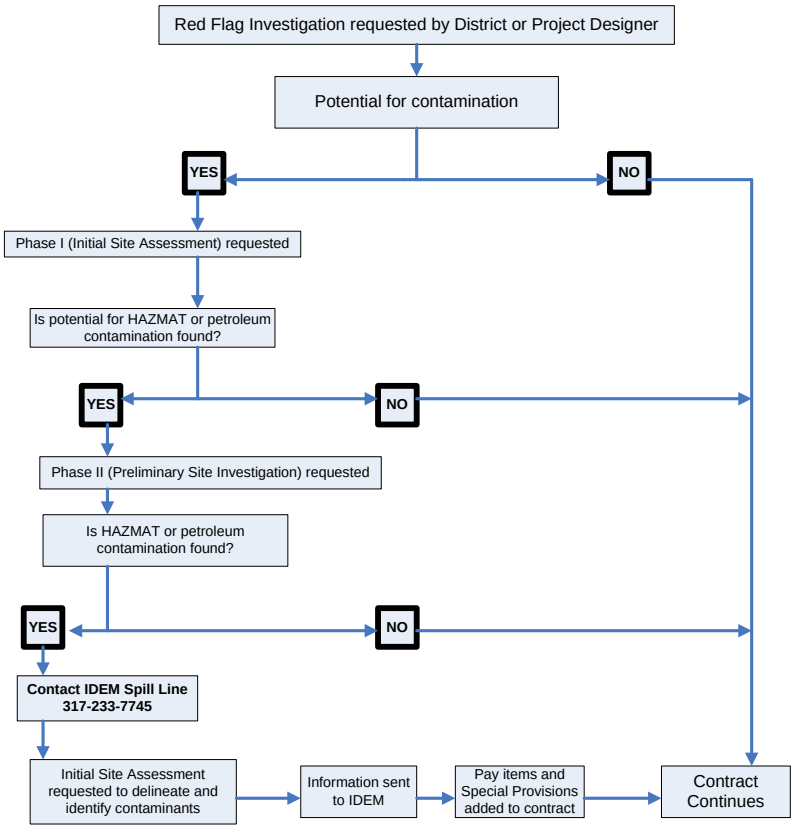
Funding for HazMat investigations (Phase I, Phase II, and any additional investigations and remediation) should be tied to the construction project's budget. The following flow diagram demonstrates the appropriate actions for this type of discovery:

Known Parcel Contamination

Procedure for Handling the Contamination or Underground Storage Tanks (USTs) found on **INDOT Owned Parcels**

Revised January 9, 2008

Office of Environmental Services (OES)
Policy Administrator: 317-233-1164
HAZMAT Supervisor: 317-232-5113



See Appendix IX for special previsions

Site Assessments

Most projects will have at least one form of site assessment performed as part of the NEPA procedure. If preliminary investigations reveal concerns, then further assessments may be required to characterize hazards to life, property and the environment.

Throughout the process of completing any Environmental Site assessment, IDEM's Risk Integrated System of Closure (RISC) should be used to determine appropriate testing methods and analysis. The HazMat Manual was written with the help of the RISC Technical Guide, but in no way was intended to substitute for a strong understanding of this guidance.

All reports for submission to IDEM must be signed by a person meeting the "environmental professional" standard outlined in 40 CFR § 312.10 and IDEM regulations.

- Professional Engineer plus three years of relevant experience, or
- Professional Geologist plus three years of relevant experience, or
- State or Tribal Certificate (CHMM, CEP, etc), plus three years of relevant experience, or
- Hold a bachelor's degree in a science or engineering field plus 5 years full time relevant experience, or
- Ten years full time relevant experience

Red Flag Investigation (RFI)

Red Flag Investigations (RFI) will be performed for all projects. The purpose of this investigation is to give a general overview of the environmental condition of the area and to highlight areas which may need additional environmental work or areas to avoid entirely. The RFI will consist of an office-based site assessment using Global Information System (GIS) and data layers available to the HazMat Unit GIS Specialist.

Requesting a RFI

To request a RFI, the requestor must send a request to the Hazardous Materials Unit GIS Specialist by e-mail or by inter-departmental mail, with a carbon copy to the Hazardous Materials Unit Supervisor. The request should include the following information:

1.) Designation number, project area, work type, county, route

2.) Area topographic map showing general location of project within the county

3.) Project map showing start and the end of project location, including cross roads and/or mile markers

4.) Description of project work and amount and location of right-of-way to be taken

5.) A summary of all environmental concerns that exist within the search area

The Hazardous Materials Unit GIS Specialist should return a completed report to the person requesting it within **2 weeks** of the request.

Performing a RFI

If the location information submitted with the RFI request is not adequate, the Management Information Portal may be used to obtain the necessary additional information. The portal is located at http://dotoasp02pw.indot.state.in.us/portal/page/portal/MIPportal/MIPmain on the INDOT intranet.

The remainder of the information can be obtained from the Indiana Geologic Survey Atlas. This website provides GIS service covering the entire state and provides layers pertaining to the environment, infrastructure, and other specifics to help in preparing the RFI. The Indiana Geologic Survey web site is www.igs.indiana.edu. From this page, follow the links to the "Interactive Map".

STEP 1

The area of review for the RFI should be a ½ mile radius around the project area. This ensures all areas of potential hazard will be checked for possible concerns. The following layers should be included within the RFI at a minimum.

- **PLSS & Quad Boundaries**
  - Counties
  - State
- **Contours, Imagery & Other**
  - Current Aerial Map
  - Elevation
- **Roads**
  - Interstates
  - Roads
  - Roadways
- **Other Infrastructure**
  - Airports
  - Cemeteries
  - Hospitals
  - Railroads
  - Recreational Facilities
  - Religious Facility
  - Schools
  - Trails
- **Environment**
  - Confined Feeding Operation
  - Construction Demolition Waste
  - Industrial Waste Sites
  - Leaking UG Storage Tanks
  - Open Dump Waste Sites
  - NPDES Pipe Locations
  - NPDES Facilities Corrective Active Sites
  - Restricted Waste Sites
  - Septage Waste Sites
  - Solid Waste Landfills
  - Superfund Sites
  - Tire Waste Sites
  - Underground Storage Tanks
  - Voluntary Remediation Program
  - Brownfields
  - Waste Transfer Stations
  - Waste Treatment Storage Disposal
- **Hydrography**
  - Canal Routes – Historic
  - Canal Structures – Historic
  - Wetland Line
  - Floodplain-DFIRM
  - Rivers and Lakes
  - Wetlands
  - Wetland Points

- **Watershed & Quality**
  Lakes - Impaired Streams – Impaired

- **Hydrogeology**
  Cave Entrance Density Hydrologic Terrains
  Karst Springs Sinkhole Areas and Sinking-Stream Basins

- **Economic Geology**
  Industrial Mineral Site (Active 2001) Petroleum Fields
  Sand and Gravel Pits - Abandoned Quarries - Abandoned

- **Mines**
  Mines – Surface Mines – Underground

STEP 2

Ecological information is required for both full & partial Red Flag Investigations. The Indiana Natural Heritage Data Center information on endangered, threatened, or rare (ETR) species and high quality natural communities should be documented for this section of the report. In order to protect the species, specific locations of sensitive areas or species **must not be listed**. List said state and federally listed, endangered, or threatened organisms as followed:

- X# of aquatic species, terrestrial species (vertebrate/invertebrate), avian species, vascular plants from the state list
- X# of aquatic species, terrestrial species (vertebrate/invertebrate), avian species, vascular plants from the federal list
- X# of state and or federal habitats listed

As found on the county list of the Indiana Natural Heritage Data Center for the county in which the project resides. The HazMat supervisor will review this and provide comment and recommendations based on INDOT/IDNR database searches.

STEP 3

As soon as the request for RFI is submitted, the Hazardous Materials Unit will forward the request for information to the Supervisor of the Historical Unit, who will initiate a historic structures review. Following their investigation, the historical report will be e-mailed to the HazMat Unit for inclusion in the RFI. The comments from the Historical Unit should be attached at the end of the RFI unless no information is available.

STEP 4

The Red Flag Investigation report should be organized as follows:

- Cover letter, including:
    1. Designation number
    2. Project title
    3. County
    4. Type of work
- SPMS project schedule
- Aerial photo of the entire project area with no other layers
- Maps with GIS layers (without aerial photograph)
    1. Infrastructure
    2. Hydrological
    3. Environmental
- Cultural Resources Section Comments

After RFI completion

All RFIs for INDOT projects are submitted to the Hazardous Materials Unit Supervisor for review and approval. The finalized original report is then sent to the requestor. The RFI will be copied for the Hazardous Materials unit records and scanned for storage. Within the Hazardous Materials files, the RFI will be filed under the designation number.

Phase I - General

A Phase I assessment is a review of information about past property use to determine whether environmental contamination may be present. They may be initiated if the RFI demonstrates any possible or likely contamination in the immediate area of the project, or if the project involves excavation or new ROW purchase, even though the RFI showed no immediate environmental concerns. The Phase I should be completed within **30 days of the date request**. These assessments should be conducted by a qualified individual as described in chapter 3 under qualified professionals.

Preparing a Phase I

The following outline provides a standard format for Phase Is performed by the HazMat Unit. It may also be used as a checklist for reviewing a consultant-prepared Phase I.

- Summary- This should include a brief description of the parcel or project and a description of the findings of the assessment.

- Introduction- This should include:
  1. A description of the purpose for the investigation.
  2. A detailed outline of the scope of service.
  3. An outline of the significant assumptions made in furtherance of the report.
  4. A discussion of the limitations and exceptions encountered in preparing the document.

- Physical Site Description and Characterization- This should include a site map and USGS quadrant map, as well as photographic documentation of the site. The following information should be included:
  1. Current land use of subject property (residential, commercial, industrial).
  2. Presence and location of potable water supply on-site and on adjacent properties.
  3. If wellhead protection areas are associated with the project, existence only.
  4. If sewer/septic system are obviously present and their location.
  5. Other types of utilities present on site.
  6. Adjacent property use and potential for environmental impact.
  7. Surface water bodies.
  8. Topography, surface characteristics.
  9. Soil types.
  10. Geology and water resources.

- Site Inspection and Interviews- This should include information collected onsite as well as any information collected through interviews.
  1. All site structures, interior and exterior, presence and usage, of ASTs, USTs, presence of PCB transformers and equipment.

2. Visual indications of suspect contamination or hazardous materials use (e.g. drums, transformers, USTs, stained areas). Note possible presence of fill material.

3. Information from city/county health departments in regards to known health risks associated with the project area. (e. coli, coliform bacteria, spills, etc)

4. Information from local fire/police/Emergency Management Agency departments in regards to all known spills in association with the site.

5. Information from previous land/property owners/occupants or workers in regards to known environmental hazards

6. Information from adjacent land/property owners/occupants in regards to known environmental hazards

- Site History- This should include information about previous land use and development back to the 1940s, as available. The following resources should be used for this review:

1. Historical maps (e.g. Sanborn Fire Insurance Maps).
2. Aerial photographs.
3. Property tax files.
4. Recorded land title records.
5. Local street directories.
6. Building department records.
7. Zoning/land use records.

- Regulatory Records Review-This should include searches of the following databases within the prescribed minimum distances.

1. Federal

   a. NPL National Priorities List within 1 mile.

   b. Superfund or CERCLIS (Comprehensive Environmental Response Compensation & Liability Information System) within 1/2 mile.

   c. RCRA Notifiers, RCRIS TSD (Resource Conservation and Recovery Information System – Treatment, Storage, and Disposal Facilities), RCRIS L&SG (Large and Small Quantity Generators), within ½ mile.

   d. ERNS (Emergency Response Notification System), SARA Title III (National Spill Reports) for the target property only.

   e. TRI (Toxic Release Inventory) for the target property only.

   f. PADS (PCB Activity Database System) for the target property only.

2. State

   a. Voluntary Remediation Program sites within ½ mile.

b. LUST sites within ½ mile.
c. UST sites within ¼ mile.
d. Brownfields within ½ mile.
e. Emergency Response files (spills) for the target property only.
f. Operating or inactive solid waste landfills within ½ mile

3. Other published information
   a. State or U.S. Geology surveys.
   b. County soil maps.
   c. Municipal/residential water supply data (http://www.in.gov/dnr/water/ground_water/well_database/searchfield.).
   d. Petroleum Data Management System (http://igs.indiana.edu/pdms/)

- Graphics-This should include spatial representation of the database searches and the site location.

1. Sites of Environmental Concern must clearly be shown:
   a. In a GIS or equivalent map product, or clear table format.
   b. With discernable radii of concern for respective searches displayed or outlined in the graphics.
   c. With proper citation attached to all graphics.

2. Location information must include:
   a. Aerial photography to display site location and corresponding location of environmental concerns.
   b. A topographical representation of the site area to the largest extent of the database search.
   c. A site location map that represents property or right of way boundaries.

3. Photographs of the site must show:
   a. Any indications of contamination.
   b. Enough information to allow for a general overview of the entire site in question.
   c. Any indication of water resources; wells, streams ponds or high water tables.

Excess Parcel Phase I Guidelines

If a Phase I is requested for an excess parcel to be sold by the department, the person preparing the Phase I needs to be especially concerned with any hazardous contamination present directly on the parcel. If conditions exist, such as topography or soil characteristics (high permeability, high water table), that would allow for the transmission of contamination from adjoining properties, then this must also be addressed in the excess parcel Phase I.

Data Evaluation and Report Generation

If there is no indication of a hazardous environmental threat found in the Phase I, then no further investigation is required. If the Phase I indicates that a high likelihood for hazardous contamination exists, a Phase II investigation will be recommended. These recommendations should be clearly stated in the summary of the Phase I. A recommendation for further investigation should be generated if and when the environmental professional responsible for the document preparation believes a reasonable risk to human health or the environment would be posed by the Recognized Environmental Concern (REC) upon project initiation or if the sale/acquisition of the property requires full disclosure/ due diligence and if the potential for danger to life, property and the environment cannot be determined from existing sources.

A Phase I report needs to be reviewed and receive a signature from Hazardous Materials Unit Supervisor, or the Environmental Policy Administrator prior to completion.

A report will be issued for the property that describes in detail the work performed and presents conclusions regarding the environmental conditions at the site. Areas of environmental concern noted during the inspection or identified during the file review will be identified and recommendations for additional work will be provided to include proposed boring locations. See Appendix II for recommended report format.

After the completion of a Phase I

The report preparer should provide five (5) paper copies of the Phase I and one (1) electronic copy (pdf format). Unless otherwise indicated, the cover letter for these reports should be from the Hazardous Materials Unit Supervisor to the project manager, with the Phase I author listed as the contact for questions. Copies should be distributed as follows:

- One (1) copy for the Project Manager. A brief summary memo, for use by the design engineer or others in INDOT, should be attached. Examples are provided in appendix III.
- One (1) copy for the Manager of the Office of Geotechnical Services, with a copy of the summary memo.
- One (1) copy for the Manager of the Office of Real Estate in Central Office or at the appropriate INDOT District office; attach a copy of the same memo as sent to the Project Manager.
- One (1) copy for the Indiana Department of Environmental Management. The transmittal for this copy should be on INDOT letterhead and include a summary of the conclusions of the Phase I (see Appendix IV for a sample letter). When this is delivered to IDEM (11th floor), a copy of the letter should be stamped with the date received by the receptionist. This copy should be retained with the project file.
- One (1) bound copy for the hazmat unit filing cabinets.
- One (1) electronic copy for the NEPA document preparer (OES) or to appropriate District Scoping Manager.

The HazMat Unit Supervisor should be sent an email summarizing the contents of the Phase I. This should include:

- Des. #
- Name of the report's author
- Town/City
- Major route
- Type of work to be done
- Whether any contamination is already known to be present

Any additional recommended work should be summarized in a letter to the Hazardous Materials Unit Supervisor. If additional investigation is required (i.e. a Phase II), it will be requested from a consultant or assigned to a member of the HazMat unit.

Reviewing a Phase I

The expected contents of this report are outlined in the following standard operating procedure. Any deviation from this outline should be addressed in the report or approved by the Supervisor of the HazMat Unit prior to submission for signature or approval.

Determining the Right of Way

The first step in the review will be to determine the Right of Way (ROW). If proposed ROW is not shown in the Phase I, request a copy of the engineer's report from the appropriate District/ Project Manager. The format of the engineer's reports and the amount of information they supply will vary greatly depending on the engineer and when it was written. In a best-case situation there will be an aerial map showing proposed ROW. If clear graphics are not available, the report will have to be read thoroughly to determine where the ROW will be taken from.

The most important parcels to be aware of are ones where INDOT will be acquiring the entire property, or where the source of potential contamination (i.e. an underground storage tank) is on the property we will be acquiring. For those parcels, we need to approach the contamination from the standpoint of **remediating** it. For properties where the Right of Way may include a plume but not the source, our responsibility is for **worker safety,** which does not require as extensive an investigation.

A comparison of the project's proposed ROW and the Phase I's search area will determine the appropriateness of the report. The report must accurately outline any concerns possible of affecting the construction project or parcel in question.

Determine Potential Sources

The second step of the review is a comparison of the report's list of databases searched against the databases outlined in this chapter. Additional databases are allowed as long as the information provides the necessary information. The information may come from direct database searches or from a pay for service consultant.

Ensure Graphical Representation

The third step of the review is to ensure the data is provided in a usable graphical format. It is essential that the information produced in the report can be compared and, if possible, overlain on project plans. Proper graphical representation allows information to be extrapolated quickly.

Eliminating Potential Sources

Review the list of potential sources and the adjacent construction area to see if any can be eliminated immediately. An example of a potential source that could be eliminated is an above-ground storage tank inside an intact secondary containment system, or a septic field in low-permeability soils that is very far from the work area.

Determine availability of previous documentation

For sites with known contamination, helpful documentation can be located in IDEM's virtual file room (http://12.186.81.89/Pages/Public/Search.aspx.). For tank sites, you will need the Facility ID (FID) number. If the FID isn't listed in the Phase I, it can be downloaded from IDEM's database at this address: http://www.in.gov/idem/programs/land/ust/ust.html

Determine the need for Additional Investigation

At the conclusion of the review it is essential that the conclusions and recommendations section of the Phase I be reviewed and evaluated. The document must provide recommendations for the necessity of further investigations when it has been determined that Recognized Environmental Concerns (REC) are present and pose a real risk to have contaminated or impacted the site(s) in question. This is the reason a Phase I report is prepared. After the determination is made, the steps outlined in section 3.2.4 of this manual will be followed regarding correspondence.

Phase II

General

A Phase II is a subsurface investigation to allow the preparer to evaluate environmental concerns raised in the Phase I. These assessments include analysis of soil and water samples to fully define the vertical and horizontal nature and extent of contamination. This information is presented in a report that documents impacts and hazards and evaluates whether further investigation is required. A Phase II investigation will be conducted (in accordance with IDEM'S RISC User's Guide) if, after the Phase I and site visit, there are any identified areas of environmental concern for which additional information is needed. A Phase II should not be requested for such sites if adequate documentation of contamination already exists.

The timeline for a Phase II is contingent upon the date it is requested and when the Phase I is completed. This timeline should allow for a turnaround time of at least 60 days. These 60 days should, in the interest of the project, end at least 30 days prior to the Ready for Contracts (RFC) date. Unless otherwise directed, Phase IIs are to be performed following the Standard Operating Procedures (SOP) outlined below.

The HazMat unit will also perform review of consultant prepared Phase IIs, as outlined in this section. Reviews of Phase II should be conducted in accordance with the following SOP to ensure the consultant follows the RISC guidance. If there are deviations from the guidance, they must be approved and must be identified in the report.

Phase II Procedure:

The preparation of a Phase II will be consistent with IDEM's RISC technical guidance. The HazMat unit will insure proper adherence to said guidance, where applicable, while performing or reviewing Phase IIs. Following are the major steps in the process:

1. Determine the entity responsibly for preparation of the Phase II (HazMat unit or Consultant).

2. Estimate schedule:

a. Find RFC date and use 30 days prior to this date for completion date (if not a realistic date for completion advise HazMat Unit Supervisor).

3. Prepare work plans, as outlined in the RISC technical guide:
   a. Site plan (sample shown below)
   b. Sampling Plan
   c. Health and Safety Plan (HASP)

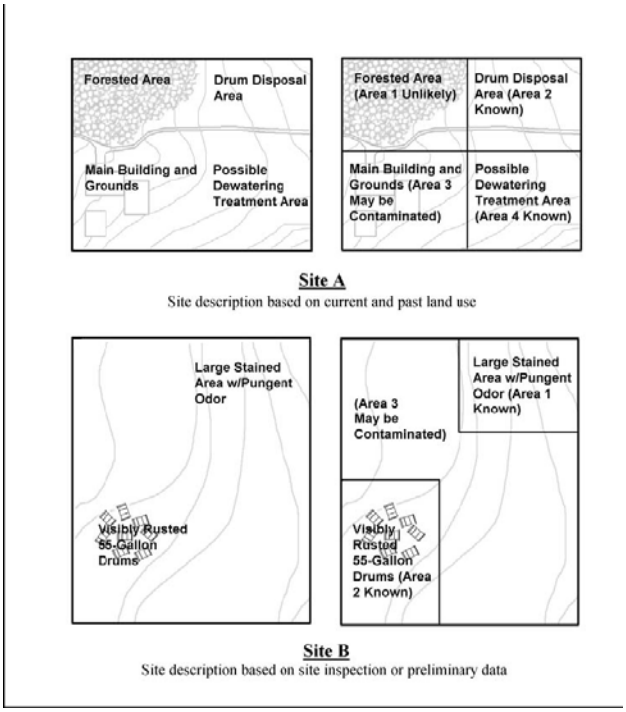


Figure 3.3.1 Site Plan example from RISC Technical Guide.

This type of plan is valuable for navigation/planning of well or boring locations. The site plan should, at a minimum, identify the site boundary and contain any information gathered in the Phase I. Areas of known contamination, likely contamination, and areas not likely to be contaminated should be labeled on the site plan. Each section should be described, classified and sampled. Considerations when selecting probe depth can include:

a. Depth of planned construction.

b. Depth of the potential source of contamination.

c. Expected depth of contaminant migration.

Assistance for developing the site plan can be found at:
http://www.in.gov/idem/programs/land/risc/tech_guide/pdfs/riscch2.pdf.

4. Conduct field sampling; ensure proper safety and sampling measures are observed at all times. During field screening the following should be sampled and assessed for the presence of hazardous materials as determined by RISC, IDEM, or direction from the HazMat Unit Supervisor.

   a. Soil
   b. Soil gas
   c. Surface water
   d. Ground water

   - Sample collection should:

     a. Be conducted in a manner consistent with the RISC Technical Guidance.
     b. Be demonstrably free from cross-contamination.
     c. Be conducted so as to minimize the spread of contamination due to the sampling event.
     d. Be overseen by an environmental professional.
     e. Abide by all applicable Federal, State, and local regulations.
     f. Include the steps outlined in the RISC User's Guide – Appendix 4. *Dated February 15, 2001.*
     g. Be conducted in conjunction with field screening (PID/FID).

Review Procedures

The first step in the review is to verify that the Phase II is consistent with the needs of and is within the scope described in the Phase I. Adjustments to the work plan may be made in the field, but they should still meet the goals of the investigation. These adjustments should be documented to avoid confusion.

Determine the accuracy and quality of the Phase II being reviewed. If the work does not conform to established standards, or refers to sites not identified for investigation, or is of poor quality; corrections should be outlined and requested in writing prior to final draft submittal for approval.

If only otherwise minor grammatical, spelling, or name mistakes are present, informal corrections will be requested on the final draft. After review and approval of the draft document, a brief summary for the project file must be written, for use by the design engineer or others in INDOT. An example is contained in Appendix IV. If no contamination is found, a short memorandum outlining the conclusions of the Phase II is all that will be required. If contamination is discovered however, a **concise** description of the contamination will

be provided. List which properties are affected, what (diesel, perchloroethylene, pesticides, etc) is present, whether soil or water is impacted, and at what depth. Included in the memorandum will be a determination as to the extent of the effect on the construction project or parcel in question.

IF CONTAMINATION IS FOUND: Phone in contamination to the Spill Line (317) 233-7745. When the spill line is contacted make it as clear as possible whether INDOT is the responsible party.

Once the Phase II is approved, ask for **two** (2) total copies from the consultant. This request should be in the format of a letter from the unit supervisor to the consultant. A sample may be found in Appendix III. Copies should be distributed as follows:

- 1 electronic copy
- 1 original for INDOT HazMat Unit files

Comment [BTL1]: Don't we still need copies for geotech, real estate and the project manager?

A memo to the appropriate offices should accompany the approved report. See Example memo in Appendix III. The memo for the PM (found in SPMS), Office of Geotechnical Services, Office of Real Estate and Environmental Services can be delivered by e- mail. IDEM's report and accompanying memo (if needed) should be hand delivered to the Office of Land Quality with a duplicate letter to be date stamped and files with the HazMat Unit file. The HazMat Unit file should be filed according to SOP in the Office of Environmental Services.

Sampling Methods

Whole Takings

If INDOT is acquiring a source of contamination, the RISC procedures for delineating contamination must be followed. Soil borings must be advanced to a depth of fourty feet below ground surface (bgs), groundwater or bedrock (probe refusal). A first boring should be as close as possible to the potential source. If the soil in this location appears contaminated (high field screening results, odor/visible staining) then additional borings must be taken. These borings should be placed at a maximum of **twenty feet in each direction** (north, east, south, and west) to allow for underground obstacle avoidance. This process should be repeated until the plume is delineated, subject to the limitations due to the presence of roads, buildings, utilities or property lines. See figure 3.3.2.

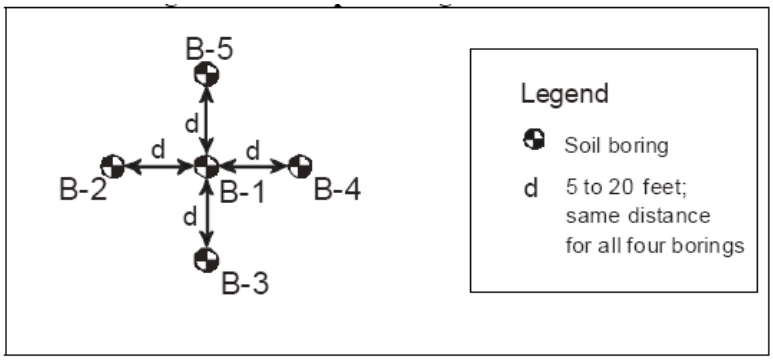


Figure 3.3.2 Typical Boring Layout from IDEM RISC Technical Guide

Step 1 Initial Borings

Figure 3.3.3, provides guidance to be used when sampling where the Default Subsurface Soil Petroleum Characterization for Sites Regulated under IC 13-11 and 329 IAC 9 (releases) parameters are to be used.

- If the results for the Contaminants of Concern (COC)s of all five (5) borings (figure 3.5.2) are below the Residential Default Closure Limit (RDCL) from Appendix V, then no sub-surface soil remediation is required.

- If the concentrations for the outer four (4) borings are below the RDCL, but the center boring is above, a Potential Exposure Concentration (PEC) should be calculated. This is the arithmetic mean for all five (5) borings plus one standard deviation. It should be compared to an acreage equivalent to the source size acre default closure level for the appropriate land use (see figure 3.5.5).

Step 2 Subsequent Borings

If after step 1, any of the four outer borings exceed the RDCL, then additional borings are needed. This procedure calls for placement of additional borings radiating from the center along the axis set in step 1 until a level at or below RDCL is reached. It is imperative to maintain the spacing used in step 1 whenever possible. These additional borings need only continue along any axis that has higher than default closure limit readings. Figure 3.3.3 demonstrates the typical placement of borings for stepping out.

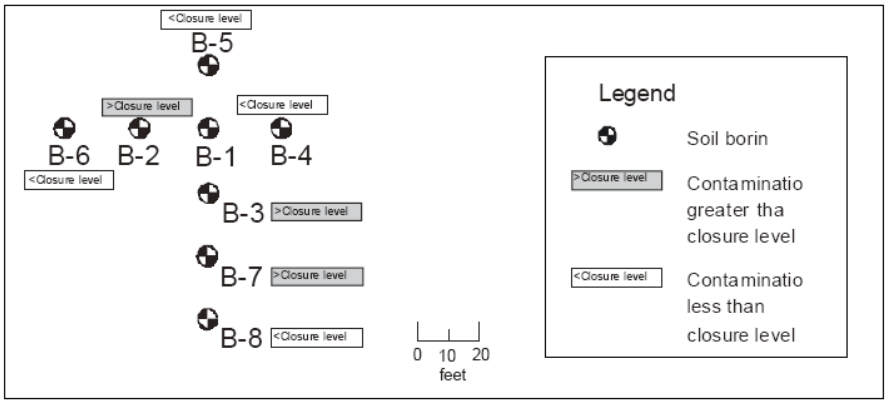


Figure 3.3.3 Step out procedure taken from IDEM RISC Technical Guide.

If this orientation is impracticable then random axis or judgment sampling may be used. In random axis sampling, a grid is imposed on the area so that any one point has equal chance of being selected for a boring location. In judgment sampling, technical knowledge and site history are used to predetermine boring locations.

Partial Takings

For partial takings, the placement and number of borings to be requested will be determined on a case by case basis. The borings should be placed adjacent to the project along the perimeter of the parcel with spacing to be determined by professional judgment.

Ground Water Contamination Evaluation

Ground water contamination is evaluated as follows per Appendix 4 of the RISC User's Guide, dated February 15, 2001:

- If all ground water COCs are below the RDCLs, ground water characterization is complete, and the ground water is eligible for residential closure.

- If the ground water COCs in the four outer borings are below the applicable RDCLs, and the COCs in the center boring are above the RDCLs but below the RISC Industrial/Commercial Default Closure Levels (IDCLs), the site may attempt immediate closure under industrial closure guidelines (an Environmental Restrictive Covenant may be needed).

- If any of the perimeter ground water COCs are at or above the RDCLs, then additional delineation (Step 2) is required.

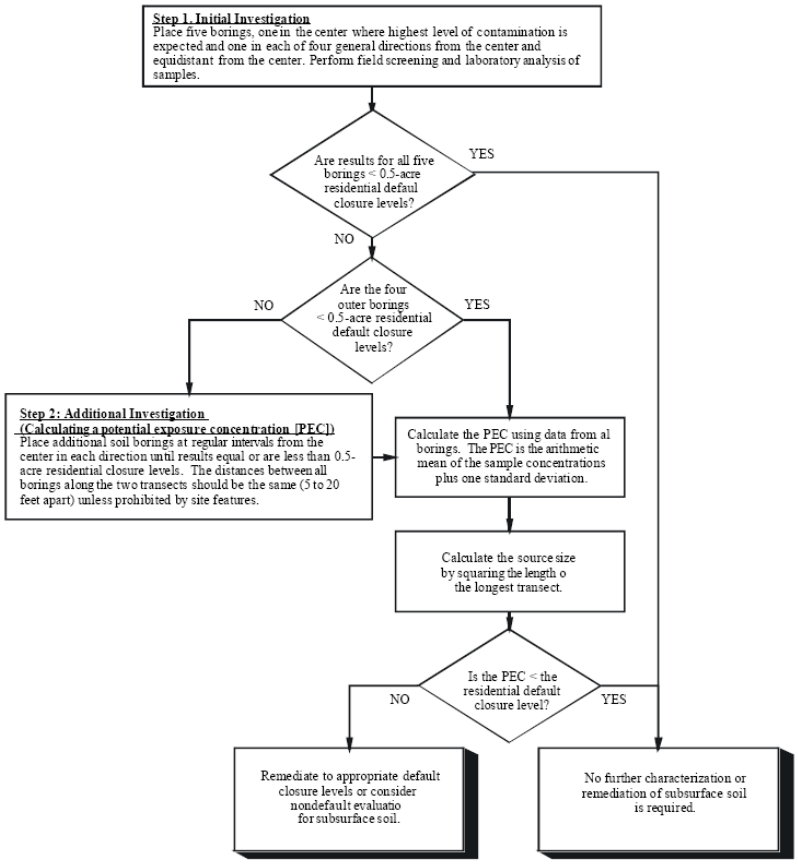


Figure 3.3.4 The Phase II process from the **RISC User's Guide – Appendix 4. Dated February 15, 2001**

Sample Parameters:

Whole Takings

If INDOT will be acquiring a potential source of contamination, the RISC guidelines must be followed in all sampling. The RISC documents are available at: http://www.in.gov/idem/programs/land/risc/tech_guide/

Partial Takings

If the work area does not include a source of contamination, the process will generally consist of determining whether contamination is present, and if so, whether it presents a hazard to workers. For gasoline/diesel spills prior to the RISC implementation, Total Petroleum Hydrocarbons (TPH) analysis (gasoline, diesel, or extended range) is satisfactory (Appendix IV). The test methods listed in the 1994 Leaking Underground Storage Tanks (LUST) guidance may be used in place of RISC for tanks abandoned prior to the RISC implementation or as agreed to by IDEM.

Handling of samples

The samples should be collected, processed, and documented following the RISC guide for Quality Assurance Quality Control (QA/QC). This includes:

- Chain-of-custody documentation
- Trip blank (for volatile organic compounds, one for each day of sampling)
- Field blank
- Equipment blank (rinsate blank)
- Field duplicates (a minimum of one duplicate for every 20 or fewer samples)
- Documentation of field events (sampling procedures, locations, conditions, and characteristics of samples collected)
- Appropriate sample containers; preservatives; and handling, storage, and transportation techniques adequate to maintain the integrity of the samples and analytical data
- Procedures conducted in a manner so as to best complete the work in accordance with the site plan and taking into account all safety measures set forth in the site safety plan.

Laboratory Analysis

Samples should be sent to an approved/accredited laboratory as designated by IDEM specifications outlined in Appendix 2 of the RISC Technical Guide. Laboratory care of the samples should be held to the RISC standard, including:

- Chain-of-custody documentation
- Holding time requirements
- Instrument tuning
- Instrument calibration records
- Initial and continuing calibration verifications
- Laboratory control samples
- Matrix spike/matrix spike duplicate samples
- Raw data
- Control criteria as outlined in IDEM's *Guidance to the Performance and Presentation of Analytical Chemistry*

Analysis of laboratory results should be reviewed and interpreted by the environmental professional writing the Phase II or responsible for signing the Phase II.

Report compilation

The Phase II report will be completed following the IDEM RISC guidance contained in Appendix I (RISC User's Guide – Appendix 1 Dated February 15, 2001). The report must at a minimum include:

1. The site plan including:
    i. Boring locations.
    ii. Well locations if applicable.
    iii. Overall site location.
2. The analytical results;
    i. In summarized form.
    ii. In actual laboratory result form.
    iii. In conjunction with boring locations.
    iv. Test boring logs.
    v. Well Construction diagrams
3. A summary of the work performed, including:
    i. The drilling procedures used.
    ii. A summary of the soils investigation conducted.
    iii. A summary of the groundwater investigation conducted.
4. Conclusions of the environmental professional

Each site must be represented separately (if multiple parcel right of way acquisition is involved). A decision by the environmental professional must be made on each site, whether the site exhibits no reasonable basis to believe there is contamination at a level demonstrating a need for further action under current laws and regulations, or that there are hazardous substances or petroleum products present at the site that would constitute a disposal or release and as such require remediation. If there is not enough information to support or provide for either of these assumptions, the environmental professional may seek additional iterations as called for in ASTM 1903-97. Conversely, if the environmental professional believes that contamination is present, but further investigation would not provide information of significant value, a recommendation of no further assessment is warranted accompanied by an explanation of why reasonable suspicion of contamination exists and detailing the lack need for further assessment.

Further Site Investigation (FSI)

Further Site Investigations (FSI) are performed after a Phase II, if needed. This type of report can be thought of as a further iteration of the Phase II. In essence it is an attempt to clarify the information produced in the previous Phase II and complete characterization of the site.

An FSI is often requested by IDEM through the HazMat Unit Supervisor, in order to determine the nature and extent of contamination. If IDEM determines that futher investigation is required in accordance with **329 IAC 9-5-6**, IDEM will request an FSI and provide a deadline by which it must be submitted. An FSI may be requested due to:

- Insufficient information in the Phase II
- Incomplete delineation of Constituents of Concern (COC) (vertical, horizontal or both)
- The terms of an Agreed Order for IDEM State Cleanup
- A need for further data to prepare to a Corrective Action Plan (CAP)

Selection of borings and monitoring well locations will be dictated by the purpose of the FSI. In all cases, the investigation will be carried out in accordance with the RISC guidance and an outline of the report can be found in Appendix II.

The timeline for an FSI is contingent on IDEM's request and the availability of drilling equipment. IDEM will impose a due date and all work should be completed prior to this date. The FSI must be reviewed by the signatory and the HazMat Supervisor then submitted to IDEM for concurrence. Extensions may be granted if a written request is submitted before the due date. The written request should include both a justification for the additional time needed and provide a date by which the report will be submitted to IDEM. Such requests will be produced by the Environmental Scientist responsible for the Phase II (review or preparation).

Corrective Action Plan (CAP)

Once IDEM has approved the FSI, a CAP will be requested if determined necessary. A CAP is a remedial strategy aimed at reducing contamination in the soil and water at a site to levels determined to present an acceptable level of health and environmental risk by IDEM.

The CAP will provide information necessary for IDEM to determine if the suggested remediation strategy will likely be successful. The CAP will need to include:

- Remedial design with alternatives
- Scaled maps
- A list of required permits
- Schedule for implementation, including construction, operation and maintenance as appropriate
- Remedial monitoring and reporting program
- Health and safety plan
- Excess Liability Trust Fund (ELTF) application or plan to submit claims for ELTF reimbursement, if applicable

A CAP must be implemented immediately upon IDEM concurrence. Once system installation or construction is completed, a CAP Implementation Report must be submitted to IDEM within **60 days**. This should document all activity to date.

Remediation

The method of remediation of the site will be determined during the CAP. There are many remediation techniques which have varying effectiveness depending on type of contamination and site conditions.

The limiting factor in selecting remediation techniques is often timeline as opposed to funding. Some remediation techniques offer a less expensive option to the remediation method of choice (dig and haul), but would likely cause costly delays in construction activities.

After the remediation technique has been chosen and approved by IDEM, the HazMat unit scientist involved in preparation or review of the CAP will inform the HazMat unit supervisor. The supervisor will prepare an estimate and appropriate documentation for submittal to the Manager of OES through the Policy Administrator for completion by the Division's Administrative Service Manager. A sample estimate and appropriate documentation are included in Appendix VI.

Environmental Restrictive Covenant

Environmental Restrictive Covenants (ERC) are written as an outcome of CAP and/or Remediation. In essence this document is produced when the remediation of the site to Residential Default Closure Limits (RDCL) is imprudent or not feasible such as due to buildings or roadways. In such cases an ERC is put in place in order to restrict the land use and to limit the potential for contact with the COCs which are present above the residential levels. The ERC is a legally binding agreement placed upon the parcel of land that is to be transferred with the land during all future transactions. ERC will be written by the Hazmat Unit or consultants, reviewed by INDOT legal and IDEM legal, and then signed by INDOT's Deputy Commissioner for Highway Management or a duly assigned representative (for INDOT owned parcels). Once reviewed and signed, the ERC must be recorded by the district real estate office with the county in which the parcel resides. After recording the ERC and a request for "No Further Action" must be requested from IDEM. An example ERC is provided in Appendix VIII.

Asbestos

Parcels

Structures on parcels purchased by INDOT are inspected for Asbestos Containing Materials (ACM) in order to comply with state emissions regulations and worker safety requirements prior to demolition or renovation. These inspections must be performed by a licensed asbestos inspector.

Asbestos parcel inspections are governed by several regulations:

- **326 IAC 14-10**
- **40 CFR§ 763 Asbestos Hazardous Emergency Response Act (AHERA)**
- **326 IAC 18-1 to 18-2-13**
- INDOT specifications (202.07)
- Applicable county or local jurisdictional regulations

Asbestos inspections are performed for parcels through requests sent by the appropriate concerned INDOT Real Estate office to the HazMat unit. This should be requested early enough to allow the inspection, laboratory analysis, and report preparation to be conducted prior to letting. The request should include the following:

- Complete address of parcel
- All parcel information (designation #, parcel#, Land Acquisition code, etc)
- Approximate square footage
- Occupancy information
- Type of parcel (residence, commercial, industrial)
- Where to obtain keys
- The date the report is needed by the requestor.

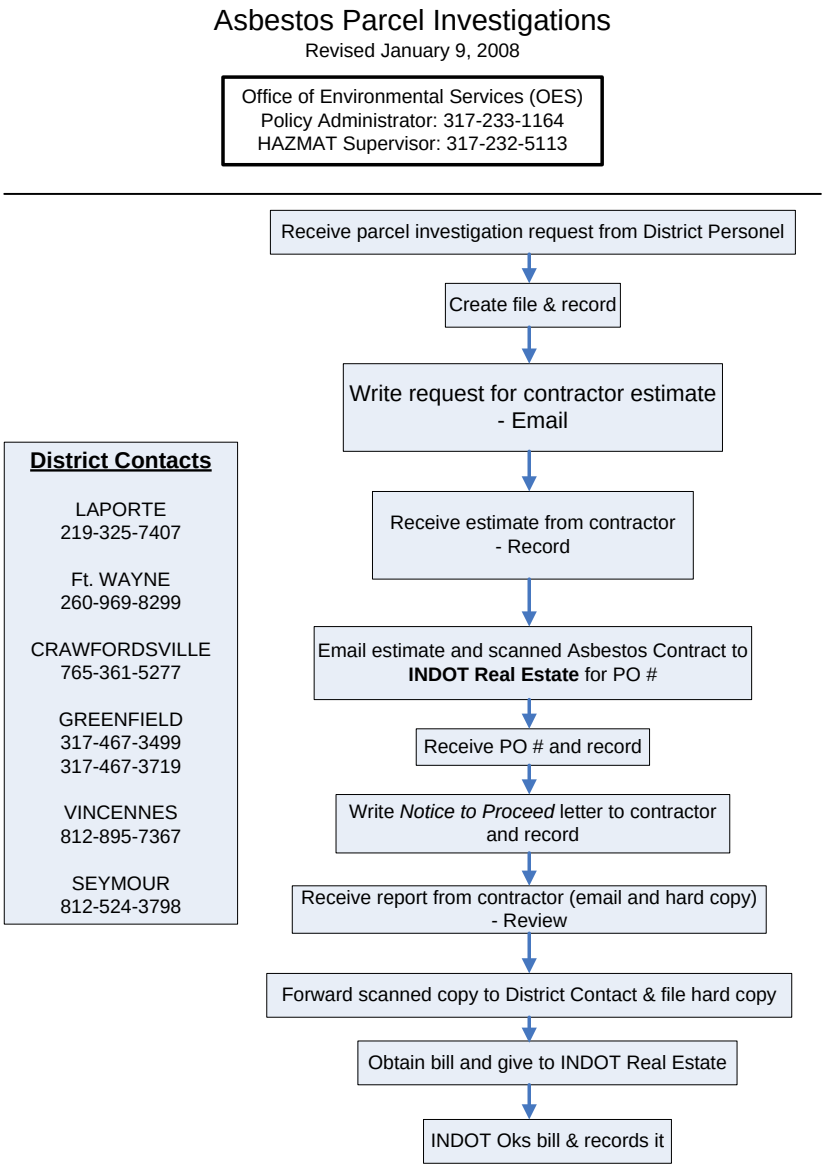
After receiving the request, the HazMat unit shall request a consultant with INDOT to perform the assessment and create a report. The report should contain at least:

- Narrative description of the property and all identifying information (designation, parcel#, Land Acquisition code, etc)
- A statement as to whether abatement is necessary
- Methods of collection
- Sample ID information
- Sample location
- Summary of results
- Appendices:
- Lab reports
- Proof of lab accreditation
- Inspector license information

The report should be provided in both electronic and hard copy forms. After reviewing the report and ensuring it meets the minimum requirements, the HazMat unit will forward the report to the requesting Real Estate office.

It is suggested that a minimum of **30 days** be given for the completion of an asbestos report. It should take no longer than 3 days for an asbestos report to be reviewed. If shorter turnaround times are necessary, the

HazMat supervisor should be contacted to determine whether this is feasible. The following figure depicts the parcel investigation process.



Bridges

Bridges being renovated or demolished by INDOT are inspected for ACM in order to comply with state emissions regulations and worker safety requirements prior to demolition or renovation. These inspections are required to be performed by a licensed asbestos inspector. Asbestos is governed by several regulations:

- **326 IAC 14-10**
- **40 CFR§ 763 (AHERA)**
- **326 IAC 18-1 to 18-2-13**
- INDOT specifications (202.07)
- Any applicable county or local jurisdictional regulations

The HazMat unit shall regularly review letting lists to identify bridge projects that will require asbestos reports. It will also insure that any project determined to need an asbestos report has an inspection completed by the district bridge engineer. If a copy of this inspection is not available on Electronic Record Management System (ERMS) or in the file at Central Office, then one will be requested through the appropriate District Bridge Engineer. After the inspection is complete, and laboratory results have been received, the unit will review the results and compile the data. The asbestos report will then be written based upon the compiled data. Completed reports will be reviewed and approved by the HazMat Unit Supervisor and distributed accordingly. If there are delays or errors in the reports, the HazMat supervisor should be contacted to ensure completion of reports in a manner that will ensure delivery in time for contract submittal.

The HazMat unit will ensure new bridge projects have the appropriate certification if designed as “asbestos free”. All certificates will be maintained in the bridge Asbestos file in the OES.

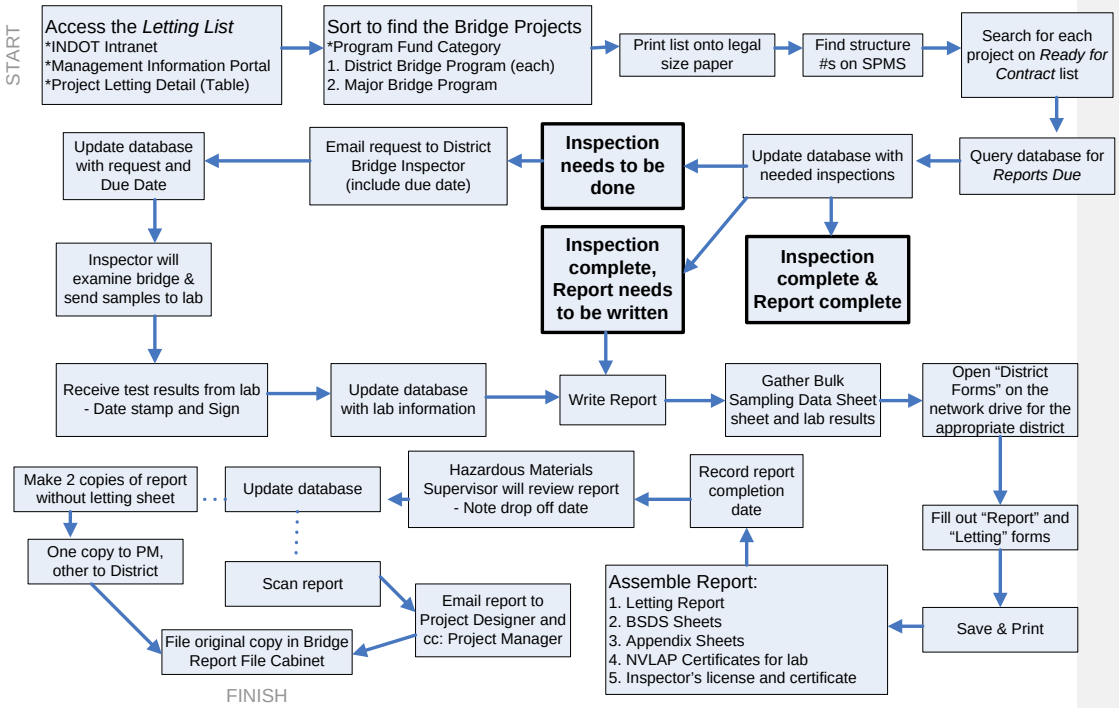
The HazMat Unit will divide the work flow as is necessary and practical based on available staff and expertise. The HazMat Supervisor will be available to help with overflow and emergency situations (pending training and licensing). The figure below depicts the bridge investigation process.

Asbestos Bridge Inspections

Revised January 9, 2008

Office of Environmental Services (OES)
Policy Administrator: 317-233-1164
HAZMAT Supervisor: 317-232-5113

Bridge Inspectors
Crawfordsville: 765-361-5273
Fort Wayne: 260-969-8261
Greenfield: 317-467-3920
LaPorte: 219-325-7553
Seymour: 812-524-3717
Vincennes: 812-895-7376



Lead

Under CERCLA, lead is considered a hazardous substance and therefore any release into the environment must be reported. In addition lead is regulated under the Clean Air Act (CAA) and the Clean Water Act (CWA), requiring that all debris known to contain lead must be controlled in order to limit the amount that becomes airborne or is sent into surface or storm water systems. Lead is also covered by OSHA regulations designed to protect workers.

Lead based paints are a concern for INDOT in two different situations. The first type includes projects which involve removal of paint from bridges and the second is during renovation of structures located on INDOT-purchased parcels. In either case, waste lead based paint is considered hazardous waste and a potential health concern.

INDOT is responsible for the waste generated in such activities and is therefore responsible for proper disposal as well as cleanup associated with any accidental release. Any paint debris produced in bridge painting removal that contains 1.5 ppm of leachable lead according to the Toxicity Characteristic Leachate Procedure (TCLP) also must be managed as hazardous waste.

The responsibility of the HazMat unit is to provide technical assistance to construction personnel on these types of projects. The unit, through the HazMat Unit Supervisor, consults with the appropriate Area, Construction, and Project Engineer or other concerned parties to verify compliance with RCRA, CERCLA, and other state and federal regulations prior to the generation and disposal of lead waste products. It will remain the responsibility of the appropriate project personnel to fill out, file, and document the stream waste in a manner sufficient to satisfy all applicable regulations.

Glossary

Acronyms

There are many terms and abbreviations used while dealing with hazardous materials; these may be agency specific or used by all members of the profession.

ACM	Asbestos Containing Material
AHERA	Asbestos Hazard Emergency Response Act
ASTM	American Society for Testing & Materials
AST	Above ground Storage Tank
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CAP	Corrective Action Plan
CAS	Chemical Abstract Service
CERCLA	Comprehensive Environmental Response Compensation & Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation & Liability Information System
CFR	Code of Federal Regulations
CL	Closure Level
CLP	Contract Laboratory Program
COC	Chemical of Concern
cPAHs	Carcinogenic Polynuclear Aromatic Hydrocarbons
CV	Coefficient of Variation
DAF	Dilution Attenuation Factor
DQA	Data Quality Assessment
DQO	Data Quality Objectives
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ERC	Environmental Restrictive Covenant
ERMS	Electronic Record Management System
EQL	Estimated Quantitation Limit
ESA	Environmental Site Assessment
FID	Flame Ionization Detector
FSI	Further Site Investigation

GC/MS	Gas Chromatography / Mass Spectrometry
GIS	Geographic Information System
HASP	Health and Safety Plan
HEAST	Health Effects Assessment Summary Tables
IDEM	Indiana Department of Environmental Management
INDOT	Indiana Department of Transportation
IRIS	Integrated Risk Information System
ISFM	Indiana State Fire Martial
LUST	Leaking Underground Storage Tanks
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MS/MSD	Matrix Spike / Matrix Spike Duplicate
MTBE	Methyl Tertiary Butyl Ether
NCEA	National Center for Exposure Assessment
NOAEL	No Observed Adverse Effects Level
NPL	National Priority List
OES	Office of Environmental Services (INDOT)
OSWER	Office of Solid Waste and Emergency Response (USEPA)
PCB	Polychlorinated Biphenyls
PEC	Potential Exposure Concentration
PID	Photo ionization Detector
POC	Perimeter of Compliance
QA/QC	Quality Assurance / Quality Control
QAPP	Quality Assurance Project Plan
RACM	Regulated Asbestos Containing Materials
RCRA	Resource Conservation & Recovery Act
RCRIS	Resource Conservation and Recovery Information System
RDCL	Residential Default Closure Limit
REC	Recognized Environmental Condition
RFC	Ready For Contract
RFD	Reference Dose
RISC	Risk Integrated System of Closure
RMSD	Root-Mean-Square Deviation
ROW	Right of Way
RSS	Ranked Set Sampling

SARA	Superfund Amendment and Reauthorization Act
SOP	Standard Operating Procedures
SPLP	Synthetic Precipitation Leaching Procedure
SPMS	Scheduling and Project Management System
SRS	Simple Random Sampling
StRS	Stratified Random Sampling
SVOC	Semi Volatile Organic Compounds
SyGS/rs	Systematic Grid Sampling with a Random Starting Point
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxic Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbons
TSD	Treatment, Storage, Disposal
UCL	Upper Confidence Limit
USGS	US Geographical Service
UST	Underground Storage Tank
VOC	Volatile Organic Compound
VRP	Voluntary Remediation Program
XRF	X-Ray Fluorescence

Definitions

Many of these terms have multiple definitions which vary slightly depending on which agency is defining it. A series of definitions may follow a term; the agency and code applicable in these cases will precede that definition. Sources are listed in Appendix I at the end of the manual.

Abatement

A process to reduce a hazard in amount, degree, or intensity; moderation.

Agreed Order (AO)

An order received from IDEM outlining timelines and methods required to remediate a contaminated property.

Asbestos

Any variety of the following asbestos forms: chrysotile, crocidolite, amosite, anthophyllite, tremolite, and actinolite. It is often used as fire-proofing and acoustical uses in buildings, various forms of insulation and vibration joints, and other uses.

Brownfield

Indiana defines a Brownfield (**IC 13-11-2-19.3)** as:

A parcel of real estate that is abandoned or inactive; or may not be operated at its appropriate use; and on which expansion, redevelopment, or reuse is complicated; because of the presence or potential presence of a hazardous substance, a contaminant, petroleum, or a petroleum product that poses a risk to human health and the environment.

Closure Report

A report filed with IDEM's UST or LUST sections in order to decommission a regulated UST. The report must contain an environmental site assessment for any removed tank.

Corrective Action Plan (CAP)

Environmental Site Assessment performed upon request of IDEM, or other responsible agency, to determine the type and extent of possible remediation described in a Phase II or FSI.

Corrosive

Per 40 CFR § 260.10,

Any liquid that is either aqueous with a ph ≤ 2 or ≥ 12.5 or a non- aqueous capable of corroding SAE 1020 steel at a rate >.25 inches per year at a temperature of 130°F.

Environmentally Restrictive Covenant (ERC)

An attachment to the property deed of a parcel that cannot feasibly or prudently be remediated below the Residential Default Closure Limit (RDCL). The ERC normally restricts the land from use as a residential facility and/or from having active water wells installed. The document must be reviewed by IDEM and INDOT legal if the property is owned by INDOT before being attached to the deed.

Extremely Hazardous Substances (EHS)

Substances specifically listed in 40 CFR§355 Appendix A which demonstrate an acutely dangerous quality i.e. toxicity, flammability, or reactivity.

Flammable

Per 40 CFR § 260.10,

Any substance that has flash point below 100°F is considered flammable.

Flash Point

Per 40 CFR § 173.115, § 173.150

The minimum temperature at which a substance gives off flammable vapors that in contact with a spark or flame will ignite.

Free Product

Any material that has been released from a container or process and presents a potential acute threat to human health or the environment, a material in excess of its solubility limit. In LUST and RCRA, it has the meaning in 329 IAC 9-1-23, or a regulated substance that is present as a nonaqueous phase liquid, for example, liquid not dissolved in water.

Further Site Investigation (FSI)

Environmental Site Assessment performed upon request of IDEM, or other responsible agency, to determine extent and amount of contamination described in a Phase II ESA.

Hazardous Materials are:

Per the USDOT, 49 CFR § 172:

1. *Any substance which has been determined by the Secretary of Transportation to pose an unreasonable risk to health or property when transported in commerce and has been so designated.*
2. *Any substance in a quantity or form that may pose an unreasonable risk to health or property when stored, transported, or used in commerce.*

Hazardous Substance
Per OSHA, 29 CFR **§** 1910:

Means any substance that exposure to which results or may result in adverse affects on the health or safety of employees.

Any substance defined under section 101(14) of CERCLA

Any biological agent and other disease-causing agent which after release will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, malfunctions in reproduction, or physical deformations in such persons or offspring.

Any substance listed by the US DOT as a hazardous material under 49 CFR § 172.01.

*Hazardous Waste as defined in 29 CFR **§** 1910.120(29 CFR **§** 1910.120)*

Per USDOT, 49 CFR § 172:

Means a material, including its mixtures and solutions, that

Is listed in Appendix A to 49 CFR §172.101

Is in a quantity, in one (1) package, which exceeds the RQ listed in 49 CFR §172.101 and

When in a mixture or solution:

For radionuclides, conforms to paragraph 7 of Appendix A to 49 CFR §172.101.

For other radionuclides, is in a concentration by weight which equals or exceeds the concentration corresponding to the RQ of the material. (49 CFR §171.8)

Hazardous Waste
Per USDOT:

Any Material that is subject to the Hazardous Waste Manifest Requirements of the US EPA specified in 40 CFR § 262(49 CFR §171.8)

Per RCRA:

a) A solid waste, as defined in §261.2, is a hazardous waste if:

(1) It is not excluded from regulation as a hazardous waste under §261.4(b); and

(2) It meets any of the following criteria:

a. Meets the standard for ignitability, corrosivity, reactivity, or toxicity.
b. Is a listed waste.
c. Is a mixture of a hazardous waste and non hazardous waste that maintains the characteristics of a characteristic hazardous waste or a mixture of a listed hazardous waste and a non hazardous waste.

Letting
Date in the project timeline when the compiled contract is sent out for bids, just prior to the contract being awarded.

Objectionable Substances (OS)
Any Substance not otherwise categorized as Extremely Hazardous Substance, Hazardous Substance, or Petroleum Substance that are: of a quantity and a type, and present for duration and in a location; so as to damage waters of the state.

Parcel
A tract of land, used to determine purchases for ROW.

Petroleum Substance (PS)
IC 13-11-2-160:
Petroleum and crude oil, or any part of petroleum or crude oil, that is liquid at standard temperature (60°F) and pressure (14.7pounds per square inch absolute).

Phase I (Ph I.)
An Environmental Site Assessment performed to outline possible areas of hazardous materials contamination. It consists of a basic records check and site visit. Formerly known as Initial Site Assessments (ISA)

Phase II (Ph II.)
An Environmental Site Assessment performed as a response to concerns uncovered in the completed Phase I ESA. Formerly known as Preliminary Site Investigation (PSI)

Reactivity
Per 40 CFR § 261.23,

A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has any of the following properties:

1. It is normally unstable and readily undergoes violent change without detonating.

2. It reacts violently with water.

3. It forms potentially explosive mixtures with water.

4. When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

5. It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

6. It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.

7. It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

8. It is a forbidden explosive as defined in 49 CFR 173.51, or a Class A explosive as defined in 49 CFR 173.53 or a Class B explosive as defined in 49 CFR 173.88.(40 CFR § 261.23)

Ready for Contracts (RFC)
Date in the project timeline when all items to be included in the project's construction contract must be compiled.

Red Flag Investigation (RFI)
Preliminary investigation performed for INDOT projects which outlines the project area and environmental concerns.

Right of Way (ROW)

Extent of land owned by INDOT adjacent to roadway. May also be used to describe parcels not associated with a roadway but acquired as part of a transportation project. Also abbreviated R/W.

Superfund

The federal government's program to locate and investigate and clean up the worst uncontrolled and abandoned toxic waste sites nationwide; administered by the Environmental Protection Agency under (CERCLA).

Toxicity

Per 40 CFR § 261.23,

A solid waste (except manufactured gas plant waste) exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, test Method 1311 in ``Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,'' EPA Publication SW-846 the extract from a representative sample of the waste contains any of the contaminants listed in table 1(40 CFR § 261.23) at the concentration equal to or greater than the respective value given in that table. Where the waste contains less than 0.5 percent filterable solids, the waste itself, after filtering using the methodology outlined in Method 1311, is considered to be the extract for the purpose of this section.

A solid waste that exhibits the characteristic of toxicity has the EPA Hazardous Waste Number specified in Table 1(40 CFR § 261.23) which corresponds to the toxic contaminant causing it to be hazardous.

Underground Storage Tank (UST)

An underground storage tank is a tank and any underground piping connected to the tank that has at least 10% of its combined volume underground. The Indiana UST regulations (329 IAC 9) apply only to USTs and piping storing either petroleum or certain hazardous substances.

Volatile Organic Compound (VOC)

A chemical with a boiling point of less than 200 °F that is not a base-neutral compound.

APPENDIX I

RISC Report Outline

I. Introduction

A. Project Identification

1. Site name, facility identification number(s), mailing address, and telephone number
2. Site location clearly marked on appropriate U.S. Geological Survey 1:24,000 scale topographic quadrangle map
3. Current owner and operator, mailing address, and telephone number
4. Site contact person or group responsible for the investigation

B. Overview of Current Contamination Conditions

1. Date the spill, release, or other contamination occurred or was discovered
2. How the spill, release, or other contamination was discovered
3. Remediation or product recovery measures already taken, including the following:
    a. Volume of product recovered
    b. Name of product recovered
4. Suspected source(s) of the spill, release, or other contamination
5. Estimated volume(s) of the spill, release, or other contamination
6. Approximate area impacted
7. Date the incident was reported to IDEM and resulting incident number (if assigned)
8. Existing deed restrictions, land-use restrictions, or environmental notice limitations.

II. Site Background and Baseline Project Assessment

A. Site History

1. Type of facility, including description of past and current operations
2. Hazardous materials used or stored on site
3. Site ownership and operational history
4. Site spill, release, and contamination history
5. Previously completed investigations, including the following:
    a. Reasons for previously completed investigations
    b. Current status of site conditions that prompted or initiated previously completed investigations
6. Potential chemical(s) of concern

B. Geographic Information

1. Political geographic data
    a. County name(s)
    b. Political Township name(s)
    c. Section (1/4, 1/4, 1/4), township, and range locations
    d. Universal Transverse Mercator (UTM) coordinates
2. Physical geographic data
    a. Topography and surface water flow and drainage patterns
    b. Nearby surface waters (including wetlands and surface drainage ways)
    c. Nearby floodways and flood plains

C. Geologic Information

1. Surficial and unconsolidated geology
    a. Surface soil descriptions from U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS)
    b. Type(s) of unconsolidated material
    c. Thickness of unconsolidated material
2. Bedrock geology
    a. Depth to bedrock
    b. Type of bedrock
    c. Description of primary and secondary structural features, such as fractures, jointings, and solution cavities, which could impact contaminant migration and remediation efforts
    d. Current status or future potential of aquifer underlying site as primary source aquifer
3. Hydrogeology
    a. Identification of regional aquifer(s)
    b. Identification, location, and copies of the Indiana Department of Natural Resources- Division Of Water (IDNR-DOW) well records for all municipal water supply wells and other high- capacity (greater than 70-gallon per minute [gpm] yield) wells within a 2-mile radius of the site
    c. Identification, location, and copies of IDNRDOW records for low-volume (less than 70-gpm yield) wells within a 1-mile radius of the site
    d. Regional depth to ground water and seasonal fluctuations
    e. Regional ground water flow direction(s) and gradient(s)
    f. Summary of existing site-specific data
    g. Other information, as necessary or appropriate

D. Ecologic Information

1. Potentially affected species of flora and fauna
2. Potentially affected species of flora and fauna on the Endangered Species List as published by the U.S. Fish and Wildlife Service and IDNR
3. Potential or observed effects of contamination on vegetation or wildlife populations

E. Preliminary Evaluation of Potentially Susceptible Areas

1. Drinking water source and wellhead protection areas
2. Geologically susceptible areas, such as surface water bodies, karst bedrock areas, and other areas
3. Socially susceptible areas, such as schools, parks, and hospitals
4. Ecologically susceptible areas that include habitats of concern, such as wetlands, caves, and parklands

F. Preliminary Evaluation of Possible Chemicals of Concern

1. Listed or actual chemical(s) of concern, including those with a Hazards Category, those listed on Material Safety Data Sheets (MSDS), and others
2. Suspected chemical(s) of concern based on site operational history
3. Description of hazards categories present
4. Copies of all MSDSs

G. Preliminary Evaluation of Potential Contaminant Transport Mechanisms

1. Discussion of surface water runoff (nonpoint mechanism)
2. Transport mechanisms to surface water, such as drainage ditches, storm sewers, and underground utility trenches
3. Discussion of ground water flow
4. Transport mechanisms to ground water, such as well bores, sewers, underground utility trenches, and karst features
5. Other transport mechanisms, such as windblown particulates and physical tracking of soil by people, animals, or machinery

H. Preliminary Evaluation of Potential Human Exposure Pathways

1. Inhalation exposure pathway
2. Ingestion exposure pathway
3. Dermal absorption exposure pathway

I. Preliminary Evaluation of Potential Ecological Exposure Pathways

1) Potential impacts to aquatic life
2) Potential impacts to wildlife and vegetation

J. Identification of Existing Data Gaps that Must Be Addressed in the Site Investigation(s)

1. Site-specific geologic information
2. Site-specific hydro geologic information
3. Site-specific ecologic information

K. Supporting Documentation Full bibliographic information must be provided in the references for all documents used, referenced, and cited.

1. Previous applicable reports prepared for the site or the project
2. Available data and other applicable documentation regarding either the site or the project
3. Conceptual site model(s)

L. Maps and Figures

All maps, figures, drawings, cross-sections, aerial photographs, and other such information must be submitted in Appendix B of the investigation report or work plan. The maps, drawings, and other items must include suitable scales, compass directions, and clearly illustrated legends. Figures must also be provided for sites where the current conditions do not accurately reflect conditions that existed at the time of the spill or release because of building renovations, underground storage tank (UST) system upgrades, and other changes. All maps and information on the maps must be legible and reproducible. Maps and figures should provide the information listed below.

1. Site location clearly on indicated U.S. Geological Survey 7.5-minute topographic quadrangle map(s)

2. Current as well as past locations of physical features of the site, including the following:

a. Property lines
b. Building outlines
c. Sidewalks
d. Buildings with basements
e. Underground and overhead utility lines
f. Raw materials and bulk storage areas
g. Aboveground storage tanks
h. USTs
i. Tank piping trenches and associated dispenser islands
j. Roads
k. Pump island piping
l. Property access points
m. Gates and fences
n. Loading and unloading areas
o. On-site waste storage, treatment, and disposal areas
p. Surface water bodies
q. On-site ground water supply wells

3. Named facilities, property lines, property uses, current land-use status (such as agricultural, industrial, or commercial), ground water wells, surface water, and other environmentally sensitive areas within a 1-mile radius of the site

4. Locations and identification numbers for all municipal water supply wells and high-capacity (greater than 70- gpm yield) water wells identified in IDNR-DOW well records within a 2-mile radius of the site

5. Locations and identification numbers for all low volume (less than 70-gpm yield) wells within a 1-mile radius of the site

6. Areas where past spills or releases have occurred, where remediation efforts are currently being conducted, or where remediation efforts have been conducted in the past

7. Soil boring and monitoring well locations

8. Horizontal extent of contaminant migration

9. Sampling locations, including sampling depths and analytical results

10. Potentiometric surfaces for all ground water monitoring events

11. Geologic and hydrologic cross sections that define the stratigraphy, vertical extent of contaminant migration, water table, and location of free product plume, if present

12. Environmentally sensitive areas

III. Statement of Work

This section is applicable to the investigation work plan only. Those preparing investigation reports should skip to Section V.

A. Investigation Objectives

1. Describe area(s) to be investigated.
2. State the objectives of the investigation for each area.
3. Explain how the site investigation will be conducted and the objectives met for
    a. Directed investigation that focuses on known or potential sources and
    b. Undirected, site wide investigation (when no historical or other information is available).
4. Provide the name, address, telephone number, and qualifications of the company performing the investigation work.
    a. Provide the name, address, telephone number, and qualifications of that company's contact person in charge of the investigation.
    b. Provide the name, address, telephone number, and qualifications of each subcontractor (such as a drilling firm or an analytical laboratory).
    c. Provide the certifications of drillers, geologists, engineers, and other professional staff.

B. Investigation Schedule

1. State when the investigation report will be submitted to IDEM for review and evaluation. Submittal must fall within the time constraints imposed by the appropriate program area requirements, and the submittal must be complete and include all information and data required by the appropriate program area.

2. Provide an investigation schedule that defines expected milestones, including the following:
    a. Mobilization of field crews and equipment,
    b. Completion of all field work, and
    c. Completion of all laboratory work.

3. Provide a projected date for submittal of the completed investigation report.

IV. Project Investigation

This section is applicable to the investigation work plan only. Those preparing investigation reports should skip to Section V. IDEM recognizes the benefits of various field techniques available to assist in defining the source area and the nature and extent of site contamination. These field techniques include blind drilling, test pit or trench excavation, electronic cone penetrating tests, and geophysical methods. Although such techniques can be used to augment or direct the placement of split-spoon soil borings and the installation of permanent ground water monitoring wells, IDEM does not recognize the results of these investigative techniques for final site confirmation. A sufficient number of soil and ground water samples must be analyzed by a laboratory to determine the full extent of

contamination. Boring locations and sampling procedures should be conducted following the recommendations in Chapters 3, 4, 6 and 7 of the RISC Technical Guide.

A. Subsurface Geology Investigation

The subsurface geology investigation is conducted concurrently with the hydrogeology investigation. Subsurface geology conditions must be determined to adequately define the nature and extent of contaminant migration away from the source area and to develop a remediation plan.

1. Soil borings or push probe sample points may be placed as needed to define the vertical and horizontal extent of soil contamination. Locations must be accurately field surveyed with a horizontal closure of less than 1-foot error and accurately depicted on a scaled map of the site.

2. Physical descriptions for all soil samples must be provided and maintained in individual boring or probe logs by an Indiana licensed professional geologist. All boring or probe logs must use the same vertical scale, include a relative surface elevation, and be submitted in a complete and reproducible form. The following are also required:

a. Continuous sampling from the top to the bottom of the hole

b. Lithologic descriptions or USDA soil textures, degree of sorting, Munsell soil colors, locations of all sedimentary contacts, gas or vapor readings, moisture content, ground water remarks, visual indications of contamination, and other relevant information

c. Any other pertinent information should be amended, as necessary, to describe subsurface site conditions

d. Well driller's certification

B. Hydrogeology Investigation

As previously noted, the hydrogeology investigation is conducted concurrently with the subsurface geology investigation. Hydro geologic conditions must be determined to adequately define the nature and extent of contaminant migration away from the source area. Because this information will be used during remediation design and development, remediation progress monitoring, and post-remediation monitoring, the ground water monitoring well network must be adequately designed during this stage of the investigation. Section 4.4.2 of the RISC Technical Guide provides further recommendations regarding ground water investigations.

1. An adequate number of ground water monitoring wells, piezometers, or direct-push sampling points must be installed to adequately define the hydrology and extent of ground water contamination. Soil boring and direct push sampling point locations can be used for well, piezometer, and ground water sampling

locations. The location, sampling, and reporting requirements are the same as those outlined above for the subsurface geology investigation. The requirements below also apply.

a. Locations must be accurately depicted on a scaled map of the site.
b. Locations must be accurately field surveyed with a horizontal closure of less than 1-foot error and a vertical closure no greater than 0.01- foot error.

2. A complete boring log must be provided for each monitoring well as discussed above for the subsurface geology investigation. For nested wells, only the deepest well should be logged.

3. Ground water monitoring well installation, construction, and development procedures must follow the standards outlined in Indiana Rule, Title 310 of the Indiana Administrative Code (IAC) 16-8-3(a) through (m) (which is to be superseded by 312 IAC 13).

4. Depending on their intended purpose, ground water monitoring wells must adhere to specific size requirements outlined in Indiana Rule 310 IAC 16-8- 3(b) (to be superseded by 312 IAC 13).

a. Ground water wells used to monitor water quality must be at least 2 inches in diameter.
b. Piezometers used to monitor water levels must be at least 0.75 inch in diameter.
c. Sampling points resulting from the use of direct push technologies can be used for preliminary screening purposes and for obtaining ground water grab samples to define the extent of ground water contamination. However, results from such screening and sampling are not valid substitutions for results obtained from sampling standard ground water monitoring wells.

5. The depth and interval of each well screen must be carefully planned to fulfill the intended purpose of the monitoring well and to obtain results for the chemicals of concern. When light nonaqueous-phase liquids (LNAPL) are involved, the guidelines below also apply.
    a. For unconfined aquifer conditions, the well screen must straddle the interface between the nonsaturated and saturated zones and must be of sufficient length to account for seasonal fluctuations in ground water level.
    b. For confined aquifer conditions, the well screen must be placed within only one water-producing horizon and must be of sufficient length to adequately monitor the entire thickness of the water-producing horizon. When dense nonaqueous-phase liquids (DNAPL) are involved, the screened intervals must be placed at the bottom of the monitored water-bearing zone(s).

6. Legible and reproducible construction logs with the same vertical scale must be submitted for each ground water monitoring well. Each construction log must include, but not necessarily be limited to, the following information:
    a. Identification and location details as outlined above for the subsurface geology investigation
    b. Surface, top-of-casing, and bottom-of-casing elevations relative to all other elevations generated for the site
    c. Stratigraphic horizons and depth intervals
    d. Size and type of the monitoring well casing
    e. Slot size of well screen
    f. Depth and length of well screen
    g. Type of backfill materials used in each interval
    h. Well development description and records New ground water monitoring wells must not be sampled until at least 24 hours after installation and development are complete.

7. Initial and all subsequent sampling methodologies must be established and clearly stated. Sampling methods must follow the standards and guidelines established by the appropriate program area, and sampling frequency and reporting requirements must be defined.

8. Hydrologic data from initial and subsequent regularly scheduled monitoring events should include, but not necessarily be limited to, the following information:

    a. If present, the depth to and thickness of product

    b. Depth to water, including a corrected depth to water if free product is present

    c. Sounding to the bottom of each monitoring well casing

    d. Field screening parameters, such as turbidity, dissolved oxygen, oxidation-reduction potential, temperature, and pH

9. Depending on the site-specific geologic, hydrogeologic, and monitoring well conditions, standard purging, micropurging, or nonpurging methods can be used to obtain representative samples from the aquifer. Standard purging must be guided by field screening parameters, and screening results must be recorded. Micropurging of each monitoring well must designed on an individual basis. IDEM has a web site that provides guidance on micro purging. Micropurging can be used if the chemicals of concern are metals, DNAPLs, or hydrocarbons. The requirements below also apply to micropurging.

    a. An in-well pump must be used.

b. Purging must be conducted at a very low pumping rates of 0.1 to 1.0 liter per minute (L/min).

c. Purging must continue until field screening parameters exhibit steady-state conditions.

d. Screening results must be recorded. Nonpurge sampling can be used if chemicals of concern are limited to hydrocarbons; benzene, toluene, ethylbenzene, and xylene (BTEX); and methyl tertiary butyl ether (MTBE). Nonpurge sampling cannot be used when the chemicals of concern are metals, DNAPL, or other pollutants. The requirements below also apply to nonpurge sampling.

i. Ground water is present in an unconfined aquifer.
ii. Free product or a visible sheen is not present.
iii. Dedicated sampling equipment is not stored within the well.
iv. The water level at the time of sampling is not above the top of the screened interval.
v. Final confirmation sampling for site closure includes results from both purge and nonpurge methods for each well.

10. One ground water sample from each monitoring well must be collected and maintained for shipment to a qualified laboratory for analyses. The investigation report should provide the following information:

a. Type of purging, sampling, sampling equipment, sample containers, and preservation techniques

b. Analytical methods, which must be appropriate for the chemicals involved

c. Sampling documentation and chain-of-custody record requirements, which should be maintained and submitted for IDEM review and evaluation

11. The sampling methodology and procedures must be detailed in the sampling section of each corrective action plan and progress report.

C. Ecological Evaluation of Susceptible Areas

Chapter 5 of the RISC Technical Guide discusses ecological evaluation of susceptible areas. The investigation report should include, as appropriate, the following information:

1. Potentially affected endangered species

2. Environmentally sensitive areas or habitats of concern, such as surface waters, riparian areas, wetlands, and flood plains

3. Aquatic and riparian species present near the site, including potential exposure of aquatic and riparian species to site-related chemicals of concern and observed impacts to surface water quality and aquatic and riparian species

4. Area wildlife and vegetation

5. Potential wildlife and vegetation exposure pathways, including observed impacts on wildlife or vegetation

D. Background Concentration Assessment

Background concentrations are useful as a basis for determining the nature and extent of soil and ground water contamination. In some site- and program-specific cases, background concentrations are used to determine final cleanup levels. Section 3.3.4.1 of the RISC Technical Guide recommends procedures for background sampling. Background sampling procedures must be conducted in accordance with the quality assurance project plan (QAPP). Chapter 3 of the RISC Technical Guide discusses QAPP requirements. The investigation report should include the following information with regard to background sampling:

1. Background investigation analytical methods

2. Methods used to collect background data (for example, sampling of soil borings or monitoring wells or reviews of existing data or literature)

3. Background sampling locations map

4. Background data in tabular form, including media, parameters, concentrations, and sampling depths and dates

5. Statistical evaluation of background results

V. Investigation Results

This section is applicable to the investigation report only. Those preparing investigation work plans should skip to Section VII. The site investigation report should include the results of the subsurface geology and hydrogeology investigations and of laboratory analyses performed on collected samples. The results must be consistent with guidelines of the appropriate program area and be accurate and complete because the results will be used to interpret site geology, hydrogeology, and the nature and extent of contaminant migration. Ultimately, the results will be used to develop conclusions and remediation recommendations. Tables, figures, and maps should be used whenever possible to summarize data and clearly present information or recommendations.

A. Subsurface Geology and Hydrogeology Investigation Results

1. Provide an interpretation of site wide stratigraphy based on soil encountered during drilling operations and described in boring logs, including the following:

a. Cross sections of the soil horizon correlated to soil and monitoring well borings
b. Physical characteristics of soils that could result in preferred contaminant migration pathways
c. Horizontal and vertical extent of soil contamination

2. Provide an interpretation of site wide hydrogeology based on conditions encountered during drilling operations and groundwater monitoring events, including the following:

a. Vadose zone depth, thickness, and seasonal fluctuations in depth and thickness

b. Horizontal and vertical extent of soil contamination in the vadose zone

c. Type(s), depth(s) to, and thickness (es) of aquifer(s) present

d. Physical description of aquifer(s) present, including the following:
    i. Hydraulic conductivity
    ii. Porosity
    iii. Storativity
    iv. Specific yield
    v. Aquifer test results

e. Ground water level measurements, including the following:
    i. Ground water flow direction
    ii. Ground water flow gradient and velocity
    iii. Seasonal fluctuations in water levels and their effect on flow direction
    iv. Water table elevations and potentiometric surface

f. Ground water quality in all encountered aquifers, significant zones of saturation, and permeable zones, including the following:
    i. Areal extent of free product plume(s)
    ii. Horizontal and vertical extent of dissolved ground water contamination
    iii. Velocity of contaminant movement in ground water

B. Laboratory Analytical Results

1. Include laboratory analytical reports in Appendix D.

2. Identify parameters detected above the action levels for the chemicals of concern.

3. Identify parameters detected below the action levels for the chemicals of concern.

4. Describe contamination in other affected media, such as sediment, surface water, and other media.

VI. Conclusions and Recommendations

This section is applicable to the investigation report only. Those preparing investigation work plans should skip to Section VII. The investigation report must provide an over all assessment of the nature and extent of on- and off-site contamination, an initial assessment of potential risks associated with the contamination, and an assessment of any additional work required. If remediation is planned, the report should provide preliminary remediation alternatives to the extent possible. A tentative schedule for the submission of a remediation work plan must also be provided.

A. Summary of Results

1. Type(s) of chemical(s) encountered and concentrations exceeding appropriate action levels, including the following:
    a. Tabulated field screening results
    b. Table(s) of analytical methods, sample containers, and preservation procedures for each sample matrix and sampling location (see Section VIII.A)
    c. Table(s) presenting analytical results for all media where parameters exceeded method detection levels (see Section VIII.A)

2. Type(s) of media impacted

3. Horizontal and vertical extent of contaminant migration, including the following:
    a. Tabulated water level measurements
    b. Geologic and hydrogeologic cross sections
    c. Site soil stratigraphy identification

4. Data gaps

B. Summary of Potential Risks Associated with Site

1. Both long- and short-term human, ecological, and environmental risks 2. Possible human, ecological, and environmental receptors

2. Current and future land-use issues, if applicable

C. Preliminary Remediation Alternatives

Feasibility studies must be taken into account when recommending remediation alternatives. The following requirements also apply to the discussion of each alternative:

1. Evaluation of overall effectiveness
2. Ability to achieve cleanup criteria
3. Expected treatment duration
4. Demonstrated treatment reliability
5. Permits required
6. Cost and time requirements

D. Recommended Remediation Method

1. Chosen remediation method
2. Schedule for submitting complete remediation work plan

VII. References

References used to prepare the investigation report or work plan or cited should be listed. Information should include author, full title, publisher, company, date, and other relevant publication information.

VIII. Appendices

A. Tables (as applicable)
   1. Field screening results
   2. Analytical methods, sample containers, and preservation methods
   3. Analytical results from all media for parameters exceeding the method detection limit
   4. Tabulated water level measurements

B. Maps and Figures
   Section II.L presents detailed guidance on preparing maps and figures.

C. Site-Specific QAPP A QAPP is required for the investigation report only. QAPPs need not be prepared for investigation work plans. The QAPP should contain all elements discussed in Chapters 3 and 4 of the RISC Technical Guide.

D. Laboratory Analytical Results Guidelines for submitting laboratory analytical results for the investigation report are presented in Section V.B.

APPENDIX I I

Memo to File

Example memo:
On letter head

November 24, 2003

MEMORANDUM

TO: xxxxxxxxxx
Manager, Greenfield District
Office of Production

FROM: xxxxxxxxx
Supervisor
Hazardous Materials Unit
Office of Environmental Services

RE: Hazardous material data for:

Road SR xx
Des. No. 9999999
Description: location X County, Indiana

Enclosed are copies of the Phase I, Initial Site Assessment and Phase II, Preliminary Site Investigation reports for the referenced project. Please see that the appropriate persons of your staff receive this information.

If you have any questions concerning this report, please contact xxxx xxxx at 23x-xxxx, or email at xxxx@indot.in.gov.

Enclosures

Example letter to IDEM:

November 24, 2003

Xxxxxxx xxx
Indiana Department of Environmental Management
IGCN 1101 State Cleanup Program
100 N. Senate Avenue
Indianapolis, IN 46206

Re: Hazardous material data for:

Road	SR xx
Des. No.	999999
Description:	Location X County, Indiana

Dear Mr / Ms. xxxx::

Enclosed are copies of the Initial Site Assessment and Preliminary Site Investigation reports for the referenced project. Please see that the appropriate persons of your staff receive this information.

If you have any questions concerning this report, please contact me at the above direct line, or email at xxxxxx@indot.in.gov.

Sincerely,

XX xxxx

HazMat Unit
Office of Environmental Services

Enclosure

APPENDIX III

Memo to Production, IDEM, Geotechnical, District Environmental, etc

INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

100 North Senate Avenue
Room N642
Indianapolis, Indiana 46204-2216 (317) 232-5348 FAX: (317) 233-4929

Mitchell E. Daniels, Jr., Governor
Karl B. Browning, Commissioner

DATE

NAME
Production Director
INDOT District
Indiana Department of Transportation

RE: *PROJECT DATA*
TYPE
CITY, Indiana
Des # *#######*

Dear *NAME*:

This letter is in response to the Request for a Phase I environmental site assessment. The Indiana Department of Transportation (INDOT) Hazardous Materials Unit has reviewed the INDOT files, the IDEM files (available in the VIRTUAL file room), and the federal regulatory files. Attached is a copy for your distribution, one copy will be sent to the district environmental staff, two copies to the District Production Office, one copy to office of Geotechnical Services. Please make any additional copies you see fit.

We have recommended *RECOMMENDATION*

If you have questions, please contact ??? at (317) 232-5113 or EMAIL@indot.in.gov.
Sincerely,

????
?????
Hazardous Materials Unit
Indiana Department of Transportation

Cc: File

INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

100 North Senate Avenue
Room N642
Indianapolis, Indiana 46204-2216 (317) 232-5348 FAX: (317) 233-4929

Mitchell E. Daniels, Jr., Governor
Karl B. Browning, Commissioner

DATE

NAME
APPROPRIATE IDEM PROGRAM
Office of *APPROPRIATE IDEM OFFICE*
100 North Senate Avenue
Mail Code xx-xx, IGCN 1101
Indianapolis, IN 46204-6015

RE: *PROJECT DATA*
TYPE
CITY, Indiana
Des # *#######*

Dear Sir/Madam:

This letter is notification of a Phase I environmental site assessment prepared by INDOT for *PROJECT NAME&LOCATION*. The Indiana Department of Transportation (INDOT) Hazardous Materials Unit has reviewed the INDOT files, the IDEM files (available in the VIRTUAL file room), and the federal regulatory files. Attached is a copy for your distribution. Please make any additional copies you see fit.

We have recommended *RECOMMENDATION*.

If you have questions, please contact xx at (xxx) xxx-xxxx or email@indot.in.gov.
Sincerely,

Xxxx Xxxx
Xxxxxx
Hazardous Materials Unit
Indiana Department of Transportation

Cc: File

INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

100 North Senate Avenue
Room N642
Indianapolis, Indiana 46204-2216 (317) 232-5348 FAX: (317) 233-4929

Mitchell E. Daniels, Jr., Governor
Karl B. Browning, Commissioner

DATE

NAME
Geotechnical Director
Production Management
Indiana Department of Transportation

RE: *PROJECT DATA*
TYPE
CITY, Indiana
Des # *#######*

Dear *NAME*:

This letter is in response to the Request for a Phase I environmental site assessment. The Indiana Department of Transportation (INDOT) Hazardous Materials Unit has reviewed the INDOT files, the IDEM files (available in theVIRTUAL file room), and the federal regulatory files. Attached is a copy for your distribution, one copy will be sent to the district environmental staff, one copy to the District Production Office, one copy to District Real Estate. Please make any additional copies you see fit.

We have recommended *RECOMMENDATION*

If you have questions, please contact xx at (xxx) xxx-xxxx or email@indot.in.gov.
Sincerely,

Xxxx Xxxxx
xxxxx
Hazardous Materials Unit
Indiana Department of Transportation

Cc: File

INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

100 North Senate Avenue
Room N642
Indianapolis, Indiana 46204-2216 (317) 232-5348 FAX: (317) 233-4929

Mitchell E. Daniels, Jr., Governor
Karl B. Browning, Commissioner

DATE

NAME
Environmental Scoping Manager
INDOT District
Indiana Department of Transportation

RE: *PROJECT DATA*
TYPE
CITY, Indiana
Des # *#######*

Dear *NAME*:

This letter is in response to the Request for a Phase I environmental site assessment. The Indiana Department of Transportation (INDOT) Hazardous Materials Unit has reviewed the INDOT files, the IDEM VIRTUAL file room, and the federal regulatory files. Attached is a copy for your distribution, one copy will be sent to the district environmental staff, two copies to the District Production Office, one copy to office of Geotechnical Services. Please make any additional copies you see fit.

We have recommended *RECOMMENDATION*

If you have questions, please contact xx at (xxx) xxx-xxxx or email@indot.in.gov.
Sincerely,

Xxx Xxxx
Xxxx
Hazardous Materials Unit
Indiana Department of Transportation

Cc: File

INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

100 North Senate Avenue
Room N642
Indianapolis, Indiana 46204-2216 (317) 232-5348 FAX: (317) 233-4929

Mitchell E. Daniels, Jr., Governor
Karl B. Browning, Commissioner

Date

Name
Company
Title
Address
city, state zip

Re: Approval of the Phase II Investigation
Project Information

Des. xxxxxxxx

The Hazardous Materials Unit of the Indiana Department of Transportation has reviewed and approved the Phase II Investigation which you submitted. Thank you for your work.

Please submit three (3) more copies of the addendum to this office for our use.

If you have any questions, please contact Xxxx Xxxx at xxx-xxx-xxxx or email@indot.in.gov. If this work causes you to exceed your remaining contract balance, please contact us before continuing.

Sincerely,

Xxxx Xxxx
Hazardous Materials Unit xxxxx
Office of Environmental Services

Cc: file

APPENDIX IV

Petroleum Constituents

Table 4.1-1. Petroleum COC Default Closure Levels - Residential

	Soil Exposure							Ground Water				
Petroleum COC	Soil Attenuation Capacity (mg/kg)	Soil Saturation (mg/kg)	Construction Worker (mg/kg)	Direct Contact (mg/kg)	Migration to Ground Water (mg/kg)	Default (mg/kg)	Detection Limit (mg/kg)	Solubility (mg/L)	MCL (mg/L)	Residential (mg/L)	Default (mg/L)	Detection Limit (mg/kg)
Benzo(a)anthracene	6,000/2,000		790 c	5.0 c	19 c	5.0 c	0.009	0.0094		0.0012 c	0.0012 c	0.0002
Benzene	6,000/2,000	590	560	7.8 c	0.034 c	0.034 c	0.005	1,800	0.005	0.0052 c	0.005 c	0.005
Benzo(b)fluoranthene	6,000/2,000		790 c	5.0 c	57 c	5.0 c	0.012	0.0015		0.0012 c	0.0012 c	0.0002
Benzo(k)fluoranthene	6,000/2,000		7,900 c	50 c	39 c	39 c	0.012	0.0008		0.012 c	0.0008 c	0.0002
Benzo(a)pyrene	6,000/2,000		79 c	0.50 c	8.2 c	0.50 c	0.016	0.0016	0.0002	0.00012 c	0.0002 c	0.0002
Chrysene	6,000/2,000		79,000 c	500 c	25 c	25 c	0.006	0.0016		0.12 c	0.0016 c	0.00015
Dibenzo(a,h)anthracene	6,000/2,000		79 c	0.50 c	18 c	0.50 c	0.020	0.0025		0.00012 c	0.00012 c	0.0002
Ethylbenzene	6,000/2,000	160	29,000	4,600	13	13	0.005	170	0.70	1.6	0.70	0.0005
Indeno(1,2,3-cd)pyrene	6,000/2,000		790 c	5.0 c	3.1 c	3.1 c	0.030	0.000022		0.0012 c	0.000022 c	0.0002
MTBE	6,000/2,000	11,000	110,000 c	670 c	0.18 c	0.18 c	0.005	48,000		0.18 c	0.04 c	0.005
Naphthalene	6,000/2,000		17,000	3,200	0.7	0.7	0.005	31		0.0083	0.0083	0.00004
Toluene	6,000/2,000	310	11,000	1,700	12	12	0.005	530	1.0	0.93	1.0	0.005
Xylenes (mixed)	6,000/2,000	170	4,800	690	210	170	0.005	160	10	0.27	10	0.005

Notes: Updated/Corrected 10-2005. Changes displayed in red.

c = Carcinogen
MCL = Maximimum contaminant level
mg/kg = Milligram per kilogram
mg/L = Milligram per liter

Table 4.1-1. Petroleum COC Default Closure Levels - Commercial / Industrial

	Soil Exposure							Ground Water				
Petroleum COC	Soil Attenuation Capacity (mg/kg)	Soil Saturation (mg/kg)	Construction Worker (mg/kg)	Direct Contact (mg/kg)	Migration to Ground Water (mg/kg)	Default (mg/kg)	Detection Limit (mg/kg)	Solubility (mg/L)	MCL (mg/L)	Commercial/ Industrial Use (mg/L)	Default (mg/L)	Detection Limit (mg/kg)
Benzo(a)anthracene	6,000/2,000		790 c	15 c	62 c	15 c	0.009	0.0094		0.0039 c	0.0039 c	0.0002
Benzene	6,000/2,000	590	560	13 c	0.35 c	0.35 c	0.005	1,800	0.005	0.052 c	0.052 c	0.005
Benzo(b)fluoranthene	6,000/2,000		790 c	15 c	74 c	15 c	0.012	0.0015		0.0039 c	0.0015 c	0.0002
Benzo(k)fluoranthene	6,000/2,000		7,900 c	150 c	39 c	39 c	0.012	0.0008		0.039 c	0.0008 c	0.0002
Benzo(a)pyrene	6,000/2,000		79 c	1.5 c	16 c	1.5 c	0.016	0.0016	0.0002	0.00039 c	0.00039 c	0.0002
Chrysene	6,000/2,000		79,000 c	1,500 c	25 c	25c	0.100	0.0016		0.39 c	0.0016 c	0.0015
Dibenz(a,h)anthracene	6,000/2,000		79 c	1.5 c	60 c	1.5 c	0.020	0.0025		0.00039 c	0.00039 c	0.0002
Ethylbenzene	6,000/2,000	160	29,000	6,800	200	160	0.005	170	0.7	10	10	0.005
Indeno(1,2,3-cd)pyrene	6,000/2,000		790 c	15 c	3.1 c	3.1 c	0.030	0.000022		0.0039 c	0.000022 c	0.0002
MTBE	6,000/2,000	11,000	110,000 c	1,400 c	3.9 c	3.9 c	0.005	48,000		0.87 c	0.87 c	0.005
Naphthalene	6,000/2,000		17,000	8,000	170	170	0.005	31		2	2	0.00004
Toluene	6,000/2,000	310	11,000	2,200	240	240	0.005	530	1	20	20	0.005
Xylenes (mixed)	6,000/2,000	170	4,800	890	430	170	0.005	160	10	20	20	0.005

Notes: Table Updated/Corrected 10-2005. Changes displayed in red.

c = Carcinogen
MCL = Maximum contaminant level
mg/kg = Milligram per kilogram
mg/L = Milligram per liter

Table 4.1-2. 0.25-Acre Migration to Ground Water
Risk-Based Closure Levels for Petroleum COCs

Chemical	Residential (mg/kg)	Commercial (mg/kg)	SAC (mg/kg)	Construction Worker (mg/kg)	Saturation Concentration (mg/kg)
Benzo(a)anthracene	29	93	2,000	790	
Benzene	**0.051**	**0.53**	2,000	**560**	**590**
Benzo(b)fluoranthene	86	111	2,000	790	
Benzo(k)fluoranthene	59	59	2,000	7,900	
Benzo(a)pyrene	12	24	2,000	79	
Chrysene	38	38	2,000	79,000	
Dibenzo(a,h)anthracene	27	90	2,000	79	
Ethylbenzene	20	300	2,000	29,000	**160**
Indeno(1,2,3-cd)pyrene	4.7	4.7	2,000	790	
MTBE	**0.27**	8.4	2,000	**110,000**	**11,000**
Naphthalene	1.1	255	2,000	17,000	
Toluene	18	360	2,000	11,000	**310**
Xylenes (mixed)	**320**	5,100	2,000	**4,800**	**170**

Notes: Updated/Corrected 10-2005. Changes displayed in **red**.

SAC = Soil attenuation capacity (fraction of organic content x 1.0E+06)

Waste Oils

Because waste oils may have an unknown variety of contaminants in them, a list of COCs cannot be developed. In specific cases, a person may propose to use the hydrocarbon oil COCs as an initial starting point.

APPENDIX V

Environmental Restrictive Covenant

AFFIDAVIT FOR RECORDING OF AN ENVIRONMENTAL RESTRICTIVE COVENANT

I, the undersigned, being of the age of majority and duly sworn upon my oath, have personal knowledge of the facts stated herein:

- the enclosed copy of the Environmental Restrictive Covenant ("ERC") and its Attachments were recorded in the _____ County Recorder's _____ Book and were cross-referenced to Deed Record Number _____ _____, which is the recorded deed that concerns the property subject to the land use requirements contained in the ERC; and

- the enclosed copy represents the ERC and its Attachments in their entirety as agreed to by the Indiana Department of Environmental Management and the property owner.

ERC County Recorder's Book and Page or Instrument Number: _____

Number of Pages Recorded: _____

I swear or affirm under the penalties for perjury that the foregoing representations are true and accurate to the best of my knowledge and belief.

_____ _____
Signature of Property Owner Date

_____ _____
Print or type name Position

STATE OF _____ _____)
) SS:
COUNTY OF _____ _____)

Before me, the undersigned, a Notary Public in and for said County and State, personally appeared _____, who acknowledged the execution of the foregoing instrument for and on behalf of the Owner.

Witness my hand and Notarial Seal this ___ day of _____, 20___.

_____

_____, Notary Public

Residing in _____ County, _____

My Commission Expires:

Environmental Restrictive Covenant

THIS COVENANT is made this _____ day of _____, 20_____, by [*insert name and address of property owner*] (together with his/her/its/their successors and assignees, collectively "Owner").

WHEREAS: Owner owns certain real estate in the County of _____, Indiana, which is more particularly described in the attached Exhibit "A" and made a part hereof ("Real Estate"), which Real Estate was acquired by deed on _____ _____, and recorded on _____, as Deed Record _____, in the Office of the Recorder of _____ County, Indiana.

WHEREAS: A corrective action plan was prepared and implemented in accordance with IC 13-23 [*select & insert other appropriate statute(s) IC 13-24 and/or IC 13-25*] and/or other applicable Indiana law as a result of a release of petroleum or regulated substances [*if applicable, can add hazardous waste and/or hazardous substances*] (collectively, "contaminants of concern") relating to the [*insert common name of cleanup site and site/incident number*] which affected the Real Estate. [*insert appropriate agency/entity/individual*] implemented certain response activities at the Real Estate, including the following: [*insert response activities which have been conducted, e.g., soil removal to remediate xyz contaminants in whatever area of the site; placement of engineered cap; remediation of groundwater, etc...*]

WHEREAS: The corrective action plan, as approved by the Indiana Department of Environmental Management ("Department"), provides that contaminants of concern will remain in the groundwater and/or in the soil of the Real Estate and requires land use restrictions that must be maintained to ensure the protection of public health, safety, or welfare, and the environment. [*Insert a short narrative description of the identity, quantity, and location of the contaminants left on the Real Estate ("Affected Areas") here.*][*Provide and attach a map showing the location of the contaminants of concern ("Affected Areas") which shall be Exhibit "B" and include a list/chart identifying the contaminants of concern and the last known concentration levels/detected parameters of those contaminants of concern which shall be attached hereto as Table 1. See attached example of an acceptable map and an example of a list of contaminants of concern with concentration levels/detected parameters. If preferred, Exhibit B & Table 1 may be combined into one Exhibit.*] Those areas where the contaminants of concern remain on the Real Estate are termed the "Affected Area(s)" and are depicted on Exhibit B, attached hereto. A list of the contaminants of concern and the concentration levels/detected parameters are set forth in Table 1, attached hereto. The corrective action plan and related site documents are incorporated herein by reference and may be examined at the offices of the Department in the public file.

NOW THEREFORE, Owner, hereby, in consideration for the promises contained herein and other good and valuable consideration imposes restrictions on the Real Estate and covenants and agrees that:

I. GENERAL PROVISIONS

1. Property Conveyance - Continuance of Provisions. The Owner shall prevent any conveyance of title, easement, or other interest in the Real Estate from being consummated without adequate and complete provision for compliance with the corrective action plan and prevention of exposure to contaminants of concern as described in paragraph 8, below.

2. Restrictions to Run with the Land. The restrictions and other requirements described in this Covenant shall run with the land and be binding upon, and inure to the benefit of the Owner of the Real Estate and the Owner's successors, assignees, heirs and lessees or their authorized agents, employees, contractors, representatives, agents, lessees, licensees, invitees, guests, or persons acting under their direction or control and shall continue as a servitude running in perpetuity with the Real Estate. No transfer, mortgage, lease, license, easement, or other conveyance of any interest in all or any part of the Real Estate by any person shall limit the restrictions set forth herein. This Covenant is imposed upon the entire Real Estate unless expressly stated as applicable only to a specific portion thereof.

3. Binding upon Future Owners. By taking title to the Real Estate, any subsequent owner agrees to comply with these restrictions and the terms of this Covenant.

4. Recordation. Unless this Covenant is terminated under paragraph 11, the Owner shall re-record this Covenant including any subsequent modifications and amendments forty-nine (49) years from the date of first recording, or any subsequent recordings, to ensure its continued applicability under the Marketable Title for Real Property Act found in IC 32-20.

5. Access for Department. The Owner shall grant to the Department and its designated representatives the right to enter upon the Real Estate at reasonable times for the purpose of determining whether the land use restrictions described in paragraph 8 are being maintained (and operated as applicable) in a manner that ensures the protection of public health, safety, or welfare and the environment; this includes the right to take samples, monitor compliance with the corrective action plan, and inspect records.

6. Written Notice of the Presence of Hazardous Substances. Owner agrees to include in any instrument conveying any interest in any portion of the Real Estate, including but not limited to deeds, leases and subleases (excluding mortgages, liens, similar financing interests, and other non-possessory encumbrances) the following notice provision:

NOTICE: THE INTEREST CONVEYED HEREBY IS SUBJECT TO AN

ENVIRONMENTAL RESTRICTIVE COVENANT, DATED_____ 200_, RECORDED IN THE OFFICE OF THE RECORDER OF _____COUNTY ON _____, 200_, INSTRUMENT NUMBER (or other identifying reference) _____ IN FAVOR OF AND ENFORCEABLE BY THE INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT.

7. Notice to Department of the Conveyance of Property. Owner agrees to provide notice to the Department no later than thirty (30) days after any conveyance of any ownership interest in the Real Estate (excluding mortgages, liens, similar financing interests, and other non-possessory encumbrances). Owner must provide Department with a certified copy of the instrument conveying any interest in any portion of the Real Estate and, if it has been recorded, its recording reference. Such notice shall also include the name and business address of the transferee.

II. RESTRICTIONS AND OBLIGATIONS

8. The Owner shall: [*Select from the list below those restrictions that are applicable to your site. Delete those that are not applicable. If you require a restriction that is not listed below, please add it.*]

a) Prohibit any activity at the Real Estate that may interfere with the response activities, long-term monitoring, or measures necessary to assure the effectiveness and integrity of any response action, or component thereof, selected and/or undertaken at the Real Estate.

b) Not use the Real Estate for residential purposes, including, but not limited to, daily care facilities (e.g., daycare centers, schools and senior citizen facilities).

c) Not use the Real Estate for agricultural purposes.

d) Neither engage in nor allow the installation or use of drinking water wells on the Real Estate [per the (cite the local well ordinance here if one exists)]. There shall be no consumptive, extractive or other use of the groundwater underlying the Real Estate that could cause exposure of humans or animals to the groundwater underlying the Real Estate, other than for site investigation and/or remediation purposes, without prior Department approval.

e) Neither engage in nor allow excavation of soil below [*insert depth to which they can excavate safely (e.g., 24 inches, 3 feet etc…)*] deep anywhere in the Affected Areas of the Real Estate as depicted on Exhibit "B" without first submitting a work plan for approval by Department at least [*Note: project manager may designate a timeframe in which they would like to see the work plan (i.e. 30 days prior to work being conducted etc…)*] prior to beginning work. Any removal, excavation or disturbance of soil from or within the Affected Areas of the Real Estate must be conducted in accordance with all applicable requirements of IOSHA/OSHA, and soil that is removed, excavated or disturbed from the

Affected Areas of the Real Estate must be managed and disposed of in accordance with all applicable federal and state laws and regulations. [Note: p*roject manager may consider adding language that prohibits the placement of impacted excavated soil on the surface or elsewhere on the Real Estate.*]

f) Not construct a dwelling or work place on the Real Estate unless a vapor intrusion control system is utilized. [*Note: this restriction is typically used when there is a vapor intrusion issue at the site.*]

g) Maintain the [*list any site-specific features that will require maintenance such (e.g., cap, asphalt, cover, fence etc…)*] so as to protect public health, safety or welfare, and the environment.

h) Notify the Department if there is a change in the land use and/or any zoning changes that affect the Real Estate.

i) Other [*insert other site specific restrictions here*]

III. ENFORCEMENT

9. Enforcement. Pursuant to IC 13-14-2-6(5), the Department may proceed in court, by appropriate action to enforce this Covenant. Owner agrees that the restrictions are enforceable, and agrees not to challenge the appropriate court's jurisdiction.

IV. TERM, MODIFICATION AND TERMINATION

10. Term. The restrictions shall apply until the Department determines that the contaminants of concern no longer present an unacceptable risk to the public health, safety, or welfare, or to the environment.

11. Modification and Termination. This Covenant shall not be amended, modified, or terminated except by written instrument executed between the Department and the owner of the Real Estate at the time of the proposed amendment, modification, or termination. Within five (5) days of executing an amendment, modification, or termination of the Covenant, such amendment, modification, or termination shall be recorded with the Office of the Recorder of _____ County and within five (5) days after recording, a true copy of the recorded amendment, modification, or termination shall be presented to the Department.

V. MISCELLANEOUS

12. Waiver. No failure on the part of the Department at any time to require performance by any person of any term of this Covenant shall be taken or held to be a waiver of such term or in any way affect the Department's right to enforce such term, and no waiver on the part of the Department of any term hereof shall be taken or held to be a waiver of any

other term hereof or the breach thereof.

13. Conflict of and Compliance with Laws. If any provision of this Covenant is also the subject of any law or regulation established by any federal, state, or local government, the strictest standard or requirement shall apply. Compliance with this Covenant does not relieve the Owner from complying with any other applicable laws.

14. Change in Law or Regulation. In the event that the Risk Integrated System of Closure ("RISC") is adopted by rule in Indiana, or in the event of any other change in applicable law or regulations, this Covenant shall be interpreted so as to ensure the continuing validity and enforceability of the restrictions listed in paragraph 8, above. In no event shall this Covenant be rendered unenforceable if Indiana's laws, regulations, RISC guidelines, or policies for environmental restrictive covenants or institutional or engineering controls change as to form or content. All statutory references include any successor provisions.

15. Notices. Any notice, demand, request, consent, approval or communication that either party desires or is required to give to the other pursuant to this Covenant shall be in writing and shall either be served personally or sent by first class mail, postage prepaid, addressed as follows:

To Owner: [*insert owner's name and address*]
_____
_____
_____
_____
_____

To Department:
IDEM, Office of Land Quality
IGCN-Suite 1154
100 N. Senate Ave.
Mail Code [*insert applicable mail code*]
Indianapolis, IN 46204-2251
Attn: [*insert project manager's name*], Leaking Underground Storage Tank Program

Any party may change its address or the individual to whose attention a notice is to be sent by giving written notice in compliance with this paragraph.

16. Severability. If any portion of this Covenant or other term set forth herein is determined by a court of competent jurisdiction to be invalid for any reason, the surviving portions of this Covenant shall remain in full force and effect as if such portion found invalid had not

been included herein.

17. Liability. An Owner's rights and obligations under this instrument terminate upon transfer of the Owner's interest in the Real Estate, except that liability for acts or omissions occurring prior to transfer shall survive transfer.

18. Authority to Execute and Record. The undersigned persons executing this Covenant on behalf of the Owner represent and certify that they are duly authorized and have been fully empowered to execute, record, and deliver this Covenant.

Owner hereby attests to the accuracy of the statements in this document and all attachments.

IN WITNESS WHEREOF, the said Owner of the Real Estate described above has caused this Environmental Restrictive Covenant to be executed on this _____ day of _____, 20____.

_____
Owner

STATE OF _____)
) SS:
COUNTY OF _____)

Before me, the undersigned, a Notary Public in and for said County and State, personally appeared _____, the _____ of the Owner, _____, who acknowledged the execution of the foregoing instrument for and on behalf of said entity.

Witness my hand and Notarial Seal this ___ day of _____, 20___.

_____

_____, Notary Public

Residing in _____ County, _____

My Commission Expires:

[The Owner's signature block and notary statement may be modified to fit the business structure of the Owner. See RISC Technical Guide App. 5 for examples]

This instrument prepared by:
[*insert name and address*]
[LUST Template ERC revised 9/02/05]

EXHIBIT A

LEGAL DESCRIPTION OF REAL ESTATE

EXHIBIT B

MAP DEPICTING THE LOCATION OF THE CHEMICALS OF CONCERN

TABLE 1

LIST OF CHEMICALS OF CONCERN AND CONCENTRATION LEVELS/DETECTED PARAMETERS

APPENDIX VI

Soil Bid Package

INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

100 North Senate Avenue
Room N642
Indianapolis, Indiana 46204-2216 (317) 232-5348 FAX: (317) 233-4929

Mitchell E. Daniels, Jr., Governor
Karl B. Browning, Commissioner

Xxx xx. 2008

Xxxx
Administrative Manager
Production Management Division

Re: Soil Remediation Plan Implementation
Location
Address
City, Indiana

The Indiana Department of Transportation (INDOT) Environmental Services Section requests proposals for the implementation of a Soil Remediation Plan for the former XXXXX located at XXXXX, Indiana (Figure 1).

SCOPE OF WORK

Removal with off-site disposal at an approved landfill is the selected remedial technology to address petroleum hydrocarbon impacted soils in the area of the two (2) former xxxx-gallon diesel underground storage tanks (UST), x (x) xxxx-gallon gasoline (UST), and x (x) xxxx-gallon diesel (UST) pit (Figure 2). The work will consist of soil remediation only. x tanks have been removed. All work estimates must include the cost of travel associated with the work.

A waste characterization sample has already been collected and analyzed from the former gasoline UST pit. The waste characterization sample analytical results will be provided to the selected Contractor. The results from this waste characterization sample will be used to establish approval for the petroleum hydrocarbon impacted soils to be disposed of at the landfill. Selection of the industrial waste facility to receive the petroleum hydrocarbon impacted soil will be the responsibility of the Contractor, subject to INDOT approval. Once the waste stream is approved by the landfill, equipment and personnel will be mobilized to the site to conduct remediation activities.

As part of the excavation activities, any surface obstructions preventing the cleanup activity must be removed. If the site is to have open pit or exposed hazardous materials, the site must be secured. Field observations and PID readings will be used to determine the extent of the xxxx impacted soils to be removed. The impacted soils are estimated to be at a depth of xx-xxfeet below ground surface (ft-bgs) and over an area xx feet long and xx feet wide (Figure 2). Based on these dimensions, the amount of petroleum hydrocarbon impacted soil to be excavated and disposed of is approximately xxxx CY or approximately xxxx tons. The xxx impacted soils will be loaded directly into properly manifested dump trucks and hauled to an approved industrial waste landfill. Pending the results of field screening, the clean soils will be returned to the excavation following the removal of the petroleum hydrocarbon impacted soils. The Contractor is responsible for determining final quantities.

Groundwater may be encountered during excavation activities. Pumping of the excavation should only be undertaken as expressly needed to expose saturated soils requiring remediation. Groundwater pumped from the

INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

100 North Senate Avenue
Room N642
Indianapolis, Indiana 46204-2216 (317) 232-5348 FAX: (317) 233-4929

Mitchell E. Daniels, Jr., Governor
Karl B. Browning, Commissioner

BID FORM

Soil Remediation Plan Implementation
xxxxx
xx
xx, Indiana

Line Item:	**Pricing:**
1. Mobilization/Demobilization	Lump Sum Bid Price: _____
2. Excavation	Lump Sum Bid Price: _____ Additional Excavation (per ton): _____
3. Transportation and Disposal of Industrial Waste	Lump Sum Bid Price: _____ Additional Transportation and Disposal (per ton): _____
4. Confirmation Soil Sampling	Lump Sum Bid Price: _____ Additional Soil Sample (per sample): _____
5. Backfill and Compaction	Lump Sum Bid Price: _____ Additional Backfill and Compaction (per ton): _____
6. Field Activities Oversight and Preparation	Lump Sum Bid Price: _____
7. Prepare Soil Remediation Report	Lump Sum Bid Price: _____
	Total Lump Sum Bid Price: _____

Additional Costs

8. Groundwater Pumping and Disposal	Mobilization:_____ Unit Bid Price (per gallon): _____

APPENDIX VII

Pay Items for HazMat Cleanup

Pay Items to Contract

UST REMOVAL

202-05823	UST, Remove and Dispose, Under 3000	Each
202-04357	UST, Remove and Dispose, 3000 to 6000	Each
202-05825	UST, Remove and Dispose, over 6000	Each
202-05826	UST, Remove and Dispose, over 10,000	Each

LIQUID MATERIAL

202-08430	Regulated Material, Remove, B	Gal
202-08431	Regulated Material, Transport, B	Gal
202-08429	Regulated Material, Dispose, B	Gal

SOLID MATERIAL

202-05550	Regulated Material, Remove, C	Cys
202-05555	Regulated Material, Transport, C	Cys
202-05545	Regulated Material, Dispose, C	Cys

TESTING

202-92222	Testing for contaminated materials TPH (soil), 24 hour return	Each
202-09106	Testing for contaminated materials MTBE and BTEX (water), 24 hour return	Each

APPENDIX VIII

Environmental Site Assessment Screening Form

ENVIRONMENTAL SITE ASSESSMENT: SCREENING CHECKLIST

Road: _____ Des # _____
Description: _____ Parcel #/Owner/Address: _____

1. **Right-of-Way Requirements, (Footprint of the project):**
   No New ROW – Strip ROW – Minor Take – Whole Parcel Take – Not Available
   Notes:

2. **Land Use History and Development:**
   Setting (rural or urban):

   Current Land Uses:

   Previous Land Uses:

   Adjacent Land Uses:

   Describe any structures on the property:

   (Industrial, Light Industry, Commercial, Agricultural, Residential, Other - indicate source of data, i.e. visual inspection, aerial photos, U.S.G.S. quad maps, etc.)

3. **Visual Inspection:**

	Property	Adjoining Property		Property	Adjoining Property
Storage Structures:			**Evidence of Contamination:**		
Underground Tanks	_____	_____	Junkyard	_____	_____
Surface Tanks	_____	_____	Auto Graveyard	_____	_____
Transformers	_____	_____	Surface Staining	_____	_____
Sumps	_____	_____	Oil Sheen	_____	_____
Ponds/Lagoons	_____	_____	Odors	_____	_____
Drums	_____	_____	Vegetation Damage	_____	_____
Basins	_____	_____	Dumps	_____	_____
Landfills	_____	_____	Fill Dirt Evidence	_____	_____
Other	_____	_____	Vent pipes or fill pipes	_____	_____
			Other	_____	_____

Field Review Completed By: _____ Date: _____

ENVIRONMENTAL SITE ASSESSMENT: SCREENING CHECKLIST

4. **Records Review**

Sources Consulted:	**Search Distance:**	**Results:**
National Priorities List (NPL)	1.0 mile	
Fed. CERCLIS list	0.5 mile	_____
Fed. RCRA	1.0 mile	_____
Fed. ERNS list	property	_____
IDEM Hazardous Waste List	1.0 mile	_____
Volunteer Clean-Up List	0.5 mile	_____
IDEM landfill list	0.5 mile	_____
IDEM LUST list	0.5 mile	_____
IDEM UST list	property and adjoining	_____
Fire Insurance Maps		_____

Record Review Completed By: _____ Date: _____

5. **Interview**

Current owner of the property or occupant of the property

Current land use? _____

Previous land use? _____

Evidence of contamination? _____

Environmental violations? _____

Has a Site Assessment been done previously? _____

Notes:

Interview Completed By: _____ Date: _____

6. **Is a Phase I, Initial Site Assessment required?** Yes No

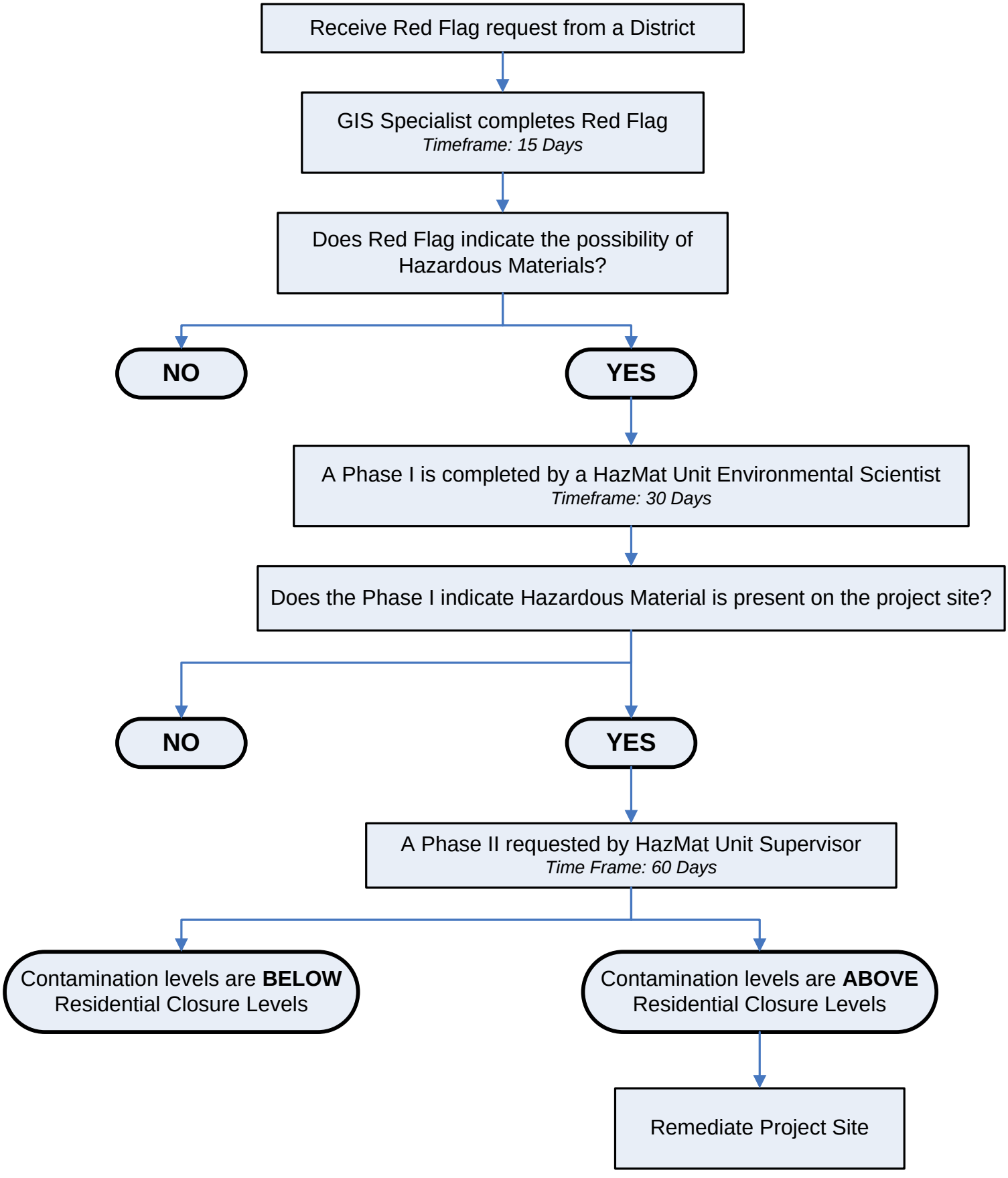
Notes:

APPENDIX IX

Procedural Flow Charts

HazMat Unit Basic Procedures

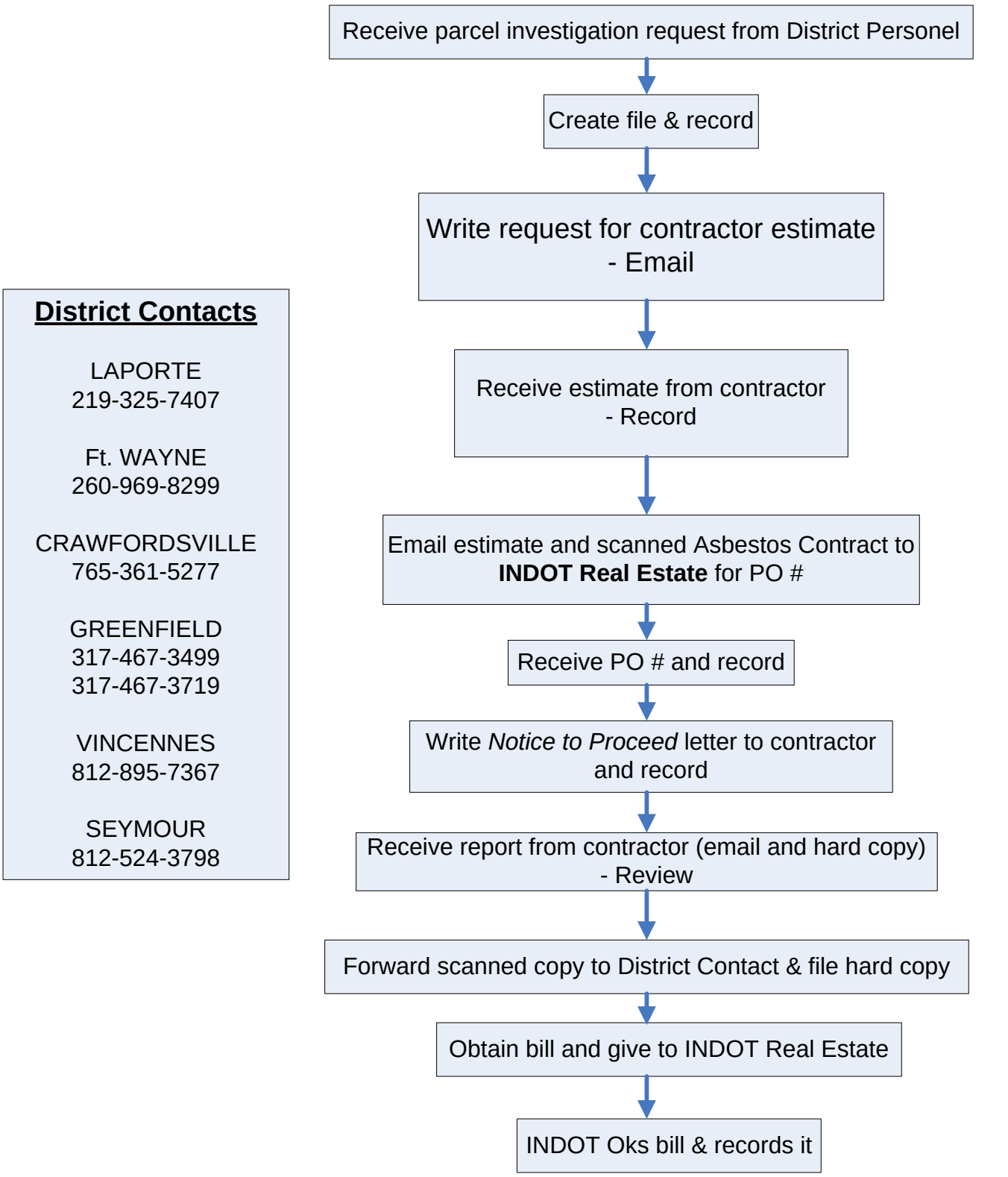
Created: March 11, 2008



Asbestos Parcel Investigations

Revised January 9, 2008

Office of Environmental Services (OES)
Policy Administrator: 317-233-1164
HAZMAT Supervisor: 317-232-5113



District Contacts

LAPORTE
219-325-7407

Ft. WAYNE
260-969-8299

CRAWFORDSVILLE
765-361-5277

GREENFIELD
317-467-3499
317-467-3719

VINCENNES
812-895-7367

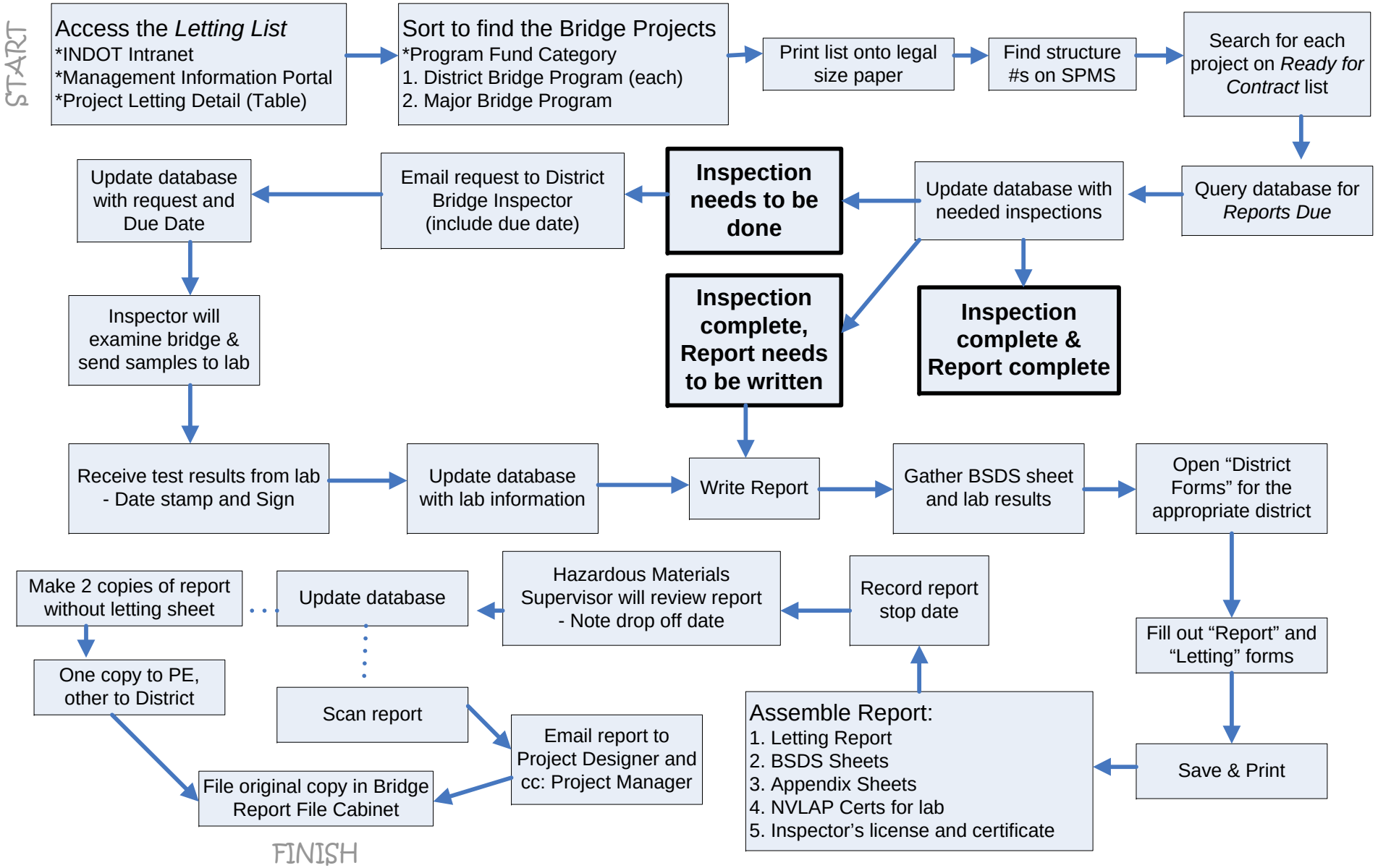
SEYMOUR
812-524-3798

Asbestos Bridge Inspections

Revised January 9, 2008

Office of Environmental Services (OES)
Policy Administrator: 317-233-1164
HAZMAT Supervisor: 317-232-5113

Crawfordsville: 765-361-5273
Fort Wayne: 260-969-8261
Greenfield: 317-467-3920
LaPorte: 219-325-7553
Seymour: 812-524-3717
Vincennes: 812-895-7376



Contractor Spills

Hazardous Material Spills on an INDOT Construction Site

Revised January 9, 2008

Office of Environmental Services (OES)
Policy Administrator: 317-233-1164
HAZMAT Supervisor: 317-232-5113

A Hazardous Material or Petroleum Spill is discovered

↓

Notify Project Engineer and Area Engineer

↓

Review spill procedure as outlined in Rule 5 Permit or Erosion Control Section of Contract (As outlined in the “Indiana Spill Rule” 327 IAC 2-5.10)

↓

Is the spill a reportable quantity? (**Over 55 gallons**)

NO

↓

Contractor cleans up the spill

YES

Contractor Responsibilities

↓

Collect Information:

1. Location
2. Type and amount of spill
3. Nearby possible receptors (ditches, wells or streams)

↓

Call IDEM Spill Line within **2 Hours** 1-317-233-7745

↓

Record incident number from IDEM

↓

Obtain Environmental Subcontractor

↓

Clean up site

↓

Contractor should submit spill Compliance Report to IDEM **AND** OES **AND** Project file

→

After the cleanup, IDEM should issue a letter confirming compliance. Submit this letter to project file, OES and District Permits

Project Engineer Responsibilities

↓

Call OES if contractor is not handling spill correctly

↓

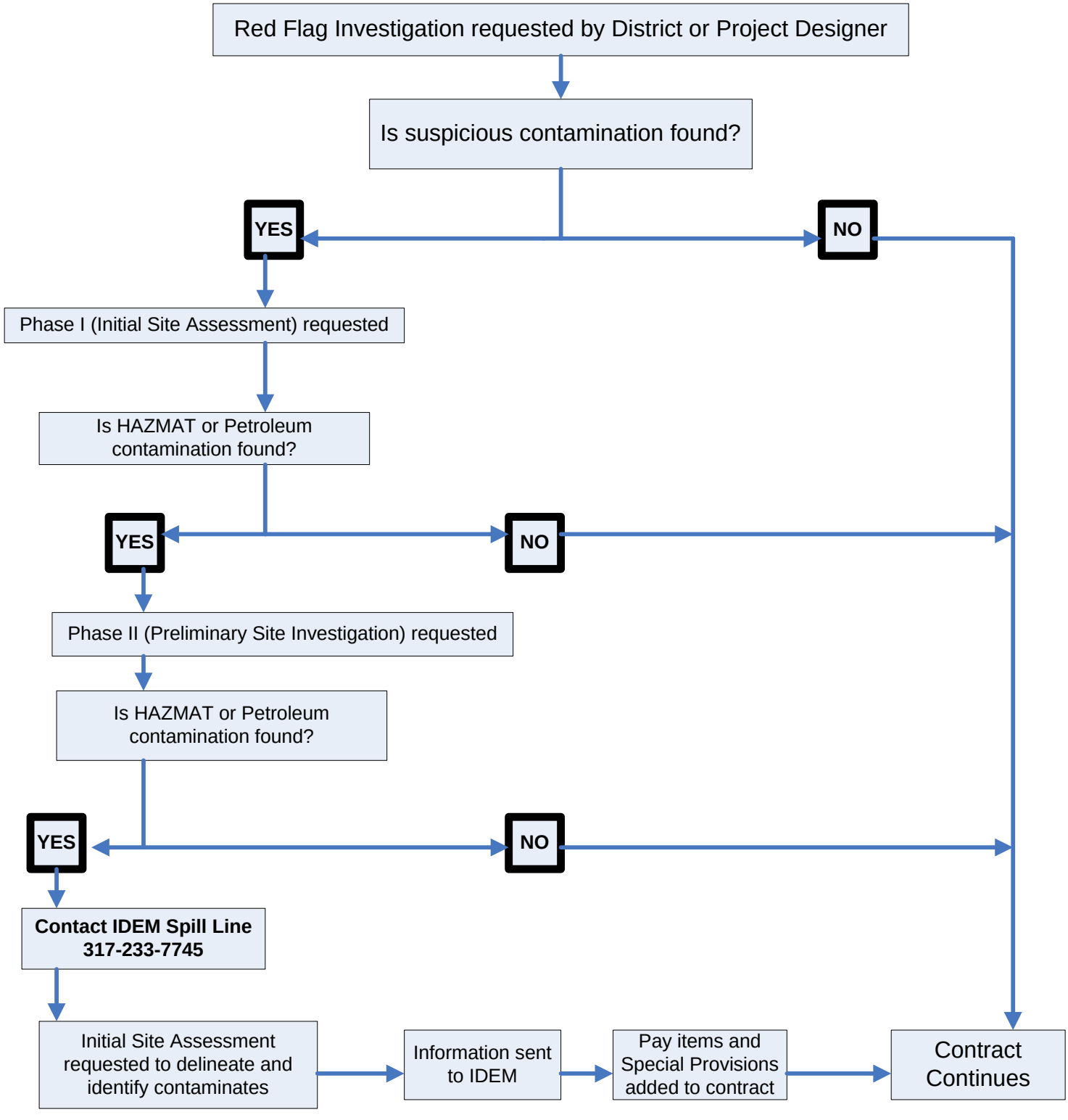
Retain copies of **ALL** communication and reports for the project file **AND** send copies to OES

Known Parcel Contamination

Procedure for Handling the Contamination or Underground Storage Tanks (USTs) found on **INDOT Owned Parcels**

Revised January 9, 2008

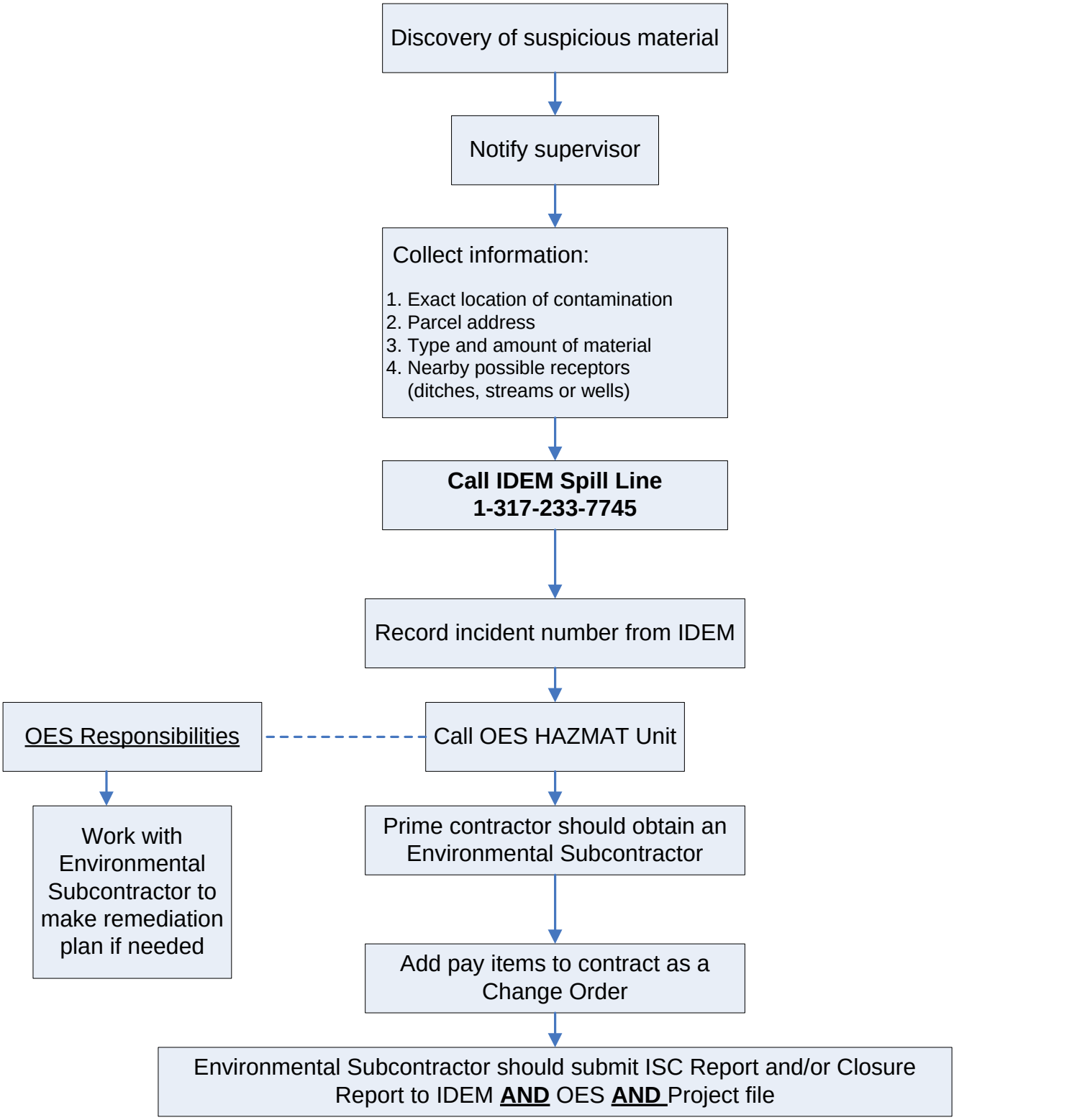
Office of Environmental Services (OES)
Policy Administrator: 317-233-1164
HAZMAT Supervisor: 317-232-5113



Discovery of Contaminated Materials or Unknown Underground Storage Tanks (USTs) on **INDOT Owned Parcels**

Revised January 9, 2008

Office of Environmental Services (OES)
Policy Administrator: 317-233-1164
HAZMAT Supervisor: 317-232-5113



Procedure for Discovery of Contaminated Materials or Unknown Underground Storage Tanks (USTs) within **Right Of Way** (ROW)

Revised January 9, 2008

Office of Environmental Services (OES)
Policy Administrator: 317-233-1164
HAZMAT Supervisor: 317-232-5113